

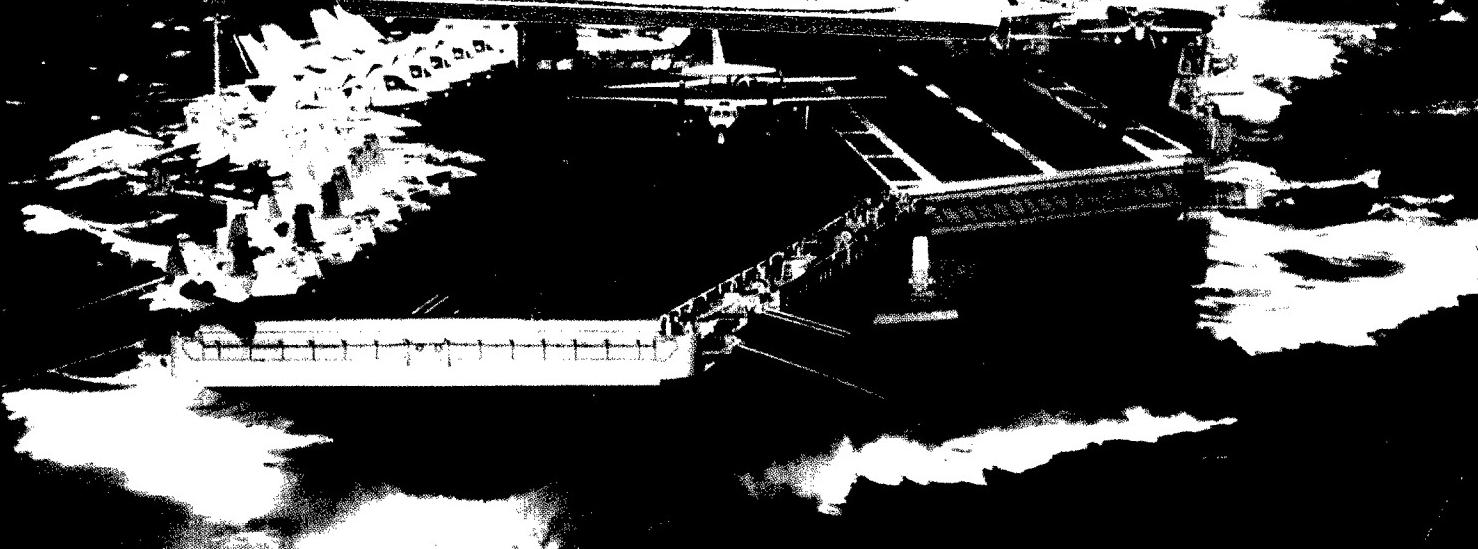
NAVAL AVIATION...

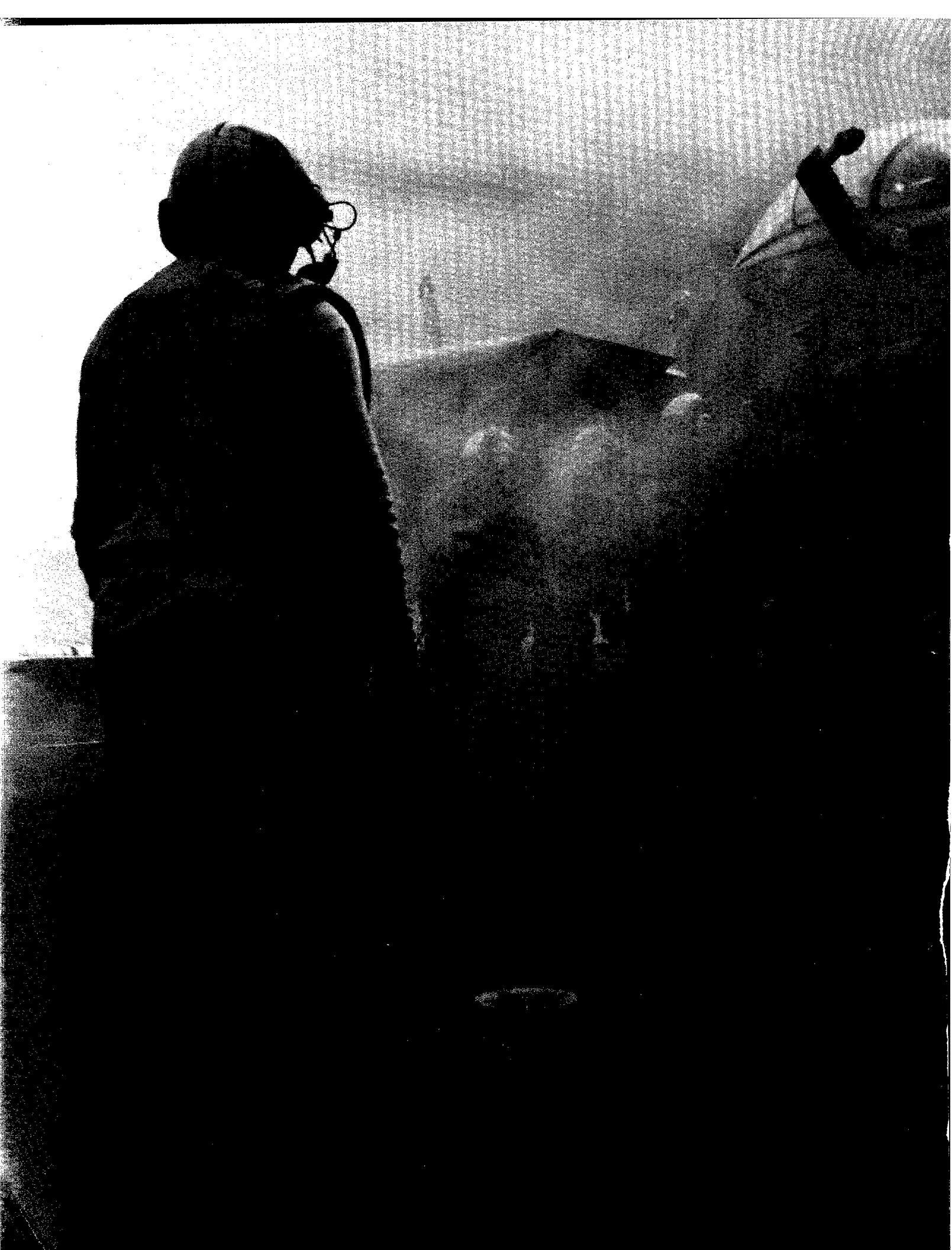
FORWARD
AIR POWER...
FROM THE SEA.

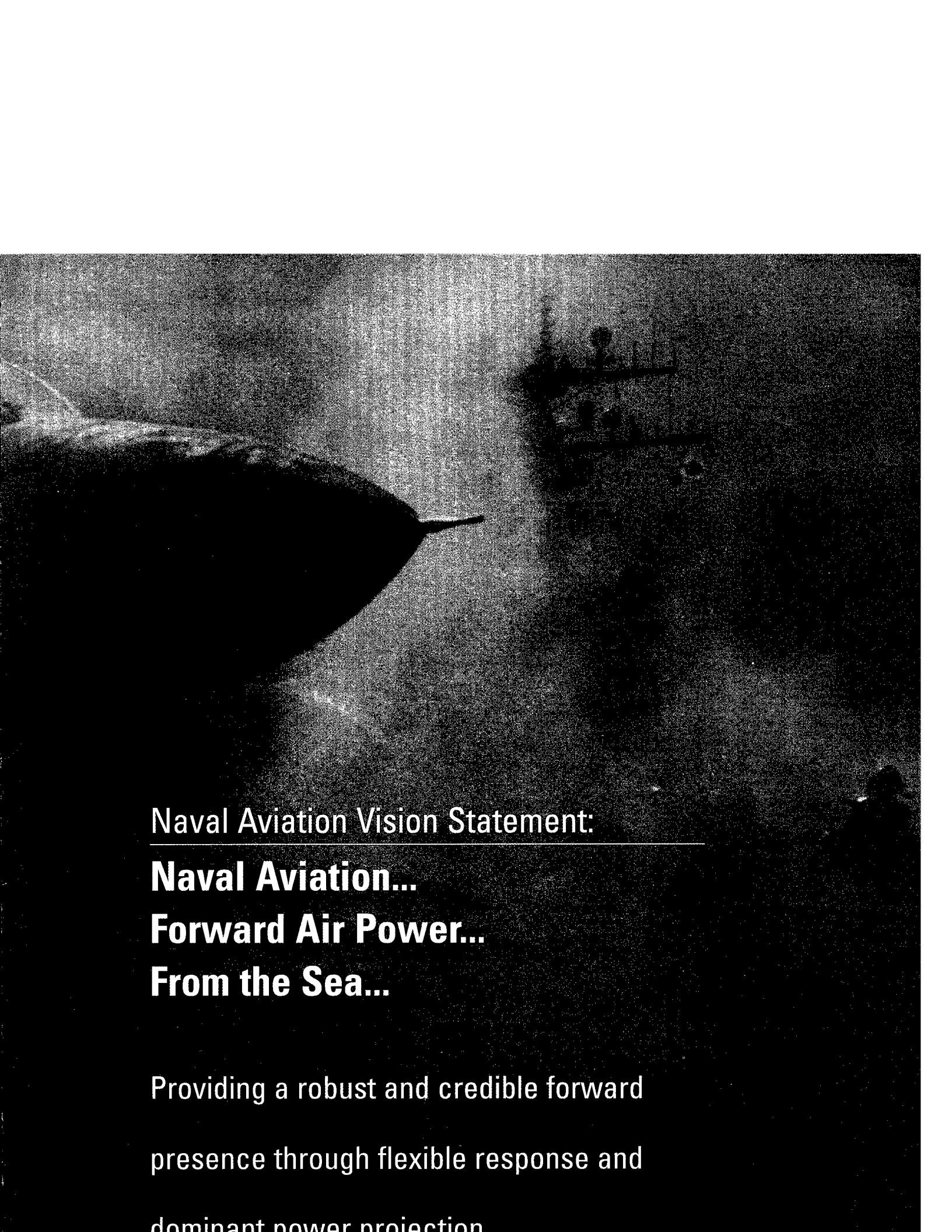


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Naval Aviation Vision Statement:

Naval Aviation...

Forward Air Power...

From the Sea...

Providing a robust and credible forward presence through flexible response and dominant power projection

C N O F O R E W O R D

For over two hundred and twenty years America's naval forces — the Navy and Marine Corps — have been forward-deployed, on call and ready to respond. In peacetime, crisis, and conflict we have answered our nation's call on countless occasions in every region of the world. Today, we find ourselves in an era of "chaotic peace" where the challenges, though sometimes ambiguous, are as daunting as ever. The proliferation of weapons of mass destruction, along with the availability of sophisticated weapons and commercial information technology on the open market contribute to uncertain and often dangerous international situations. Our nation's need for unencumbered, forward-deployed, expeditionary forces to provide true flexibility for rapid response will be critical in the 21st century. The unique expeditionary nature of our Service will permit America to respond whenever and wherever America's interests, citizens, or friends are at risk. Most recently, the Navy-Marine Corps Team has responded in real-world operations in the Caribbean, Africa, Bosnia, Albania, the Arabian Gulf, Western Pacific, and Northeast Asia.



The expeditionary nature of naval forces means that we will continue to be the force of choice for crisis response. Our unique ability to provide combat-capable, self-sustained, unencumbered forces on-scene, almost indefinitely, that can influence and "shape" events ashore, will ensure that we can prevent situations from developing into a crisis or conflict. Our ability to achieve and sustain full battlespace dominance will become ever more important. Naval Aviation — Navy-Marine Corps Aviation — will play a critical role in ensuring that we have battlespace dominance in future conflicts. The twin centerpieces of naval expeditionary forces are our aircraft carriers with their embarked air wings and our amphibious assault ships with their embarked Marine Expeditionary Units. The multimission aircraft that are part of these units give us the unique flexibility to respond quickly and precisely. The question for our vision of the future is "How can we best leverage technology and implement innovation?" We must exploit the rapid changes in technology to better enhance our precision strike, battlespace superiority, operational maneuver, and information dominance to remain relevant in a still-dangerous world.

Implementing our vision for the future is important to ensure continued success well into the next century. We must be organized, trained, and equipped to meet the challenges that will confront us. Our goal, therefore, is to give our people the tools they need to do what they have always done — to go in harm's way and prevail. This document provides a vision of Naval Aviation's long-range strategic planning. It was produced not by policy-makers in Washington, but by a team of Fleet aviators from all communities. Our planning and programming decisions must be focused on being ready both today and 20 years from now. Our country deserves no less.

Jay L. Johnson
Admiral, U.S. Navy
Chief of Naval Operations

C M C F O R E W O R D

First to fight. This is more than just a Marine Corps recruiting slogan — this is the legacy of the United States Naval Services. For over 220 years, this nation has learned that they can depend on their Naval Services to be ready for any challenge, in any clime, in any place, at any time. In conflicts ranging from high-intensity battles such as the ones fought at Guadalcanal, Midway, Iwo Jima, Inchon, and Desert Storm, to low-intensity conflicts like Haiti, Grenada, and most recently Albania, the nation has looked to the Navy and Marine Corps team to provide an on-the-scene, forward-deployed, sea-based combined arms force to maintain the peace and, when necessary, to win our nation's battles.



Without doubt, one of the major reasons that the Naval Services have developed into the potent warfighting force that they are today can be directly attributed to the strength and versatility of their Naval Aviation. Shortly after the Wright Brothers' Flyer took to the air at Kitty Hawk, North Carolina, Navy and Marine Corps visionaries such as Eugene Ely and Alfred A. Cunningham realized the potential applications of airpower in future naval campaigns. They believed that the naval forces of the future would have to fight as an integrated team, on the sea, on land, and *in the air*. From these early visionaries' quest grew a naval and amphibious combined arms capability that changed the course of history. For the last 87 years, the Navy and the Marine Corps have integrated the power and potential of Naval Aviation into their warfighting organizations — giving rise to the most powerful naval and amphibious power projection force ever known to mankind.

From its humble beginnings as a sea-plane and balloon force before the First World War, Naval Aviation has evolved into one of the more potent, flexible, and innovative forces in the history of air warfare. During the 20th century, Naval Aviation pioneered innovations such as aircraft carriers, steam catapults and arresting wires, dive-bombing, close air support, aerial medical evacuation, vertical assault, and STOVL. As we stand poised on the brink of the 21st century, Naval Aviation is once again forging ahead — developing and procuring the technologies we need to prevail on our future battlefields of the 21st century, such as the V-22 Osprey tilt-rotor, and the STOVL Joint Strike Fighter.

The United States Navy and Marine Corps have earned a reputation for being forward thinking and innovative, while at the same time being always ready to respond to any threat to our national security. The challenges and uncertainties looming off our bow in the 21st century will require the Naval Services to stay true to this legacy of vision, innovation, and readiness. The Naval Services have made their greatest progress when we thought, planned, innovated, trained, and fought as a team. As in the past, this team philosophy is the key to our future.

Charles C. Krulak
General, U.S. Marine Corps
Commandant of the Marine Corps



TABLE OF CONTENTS

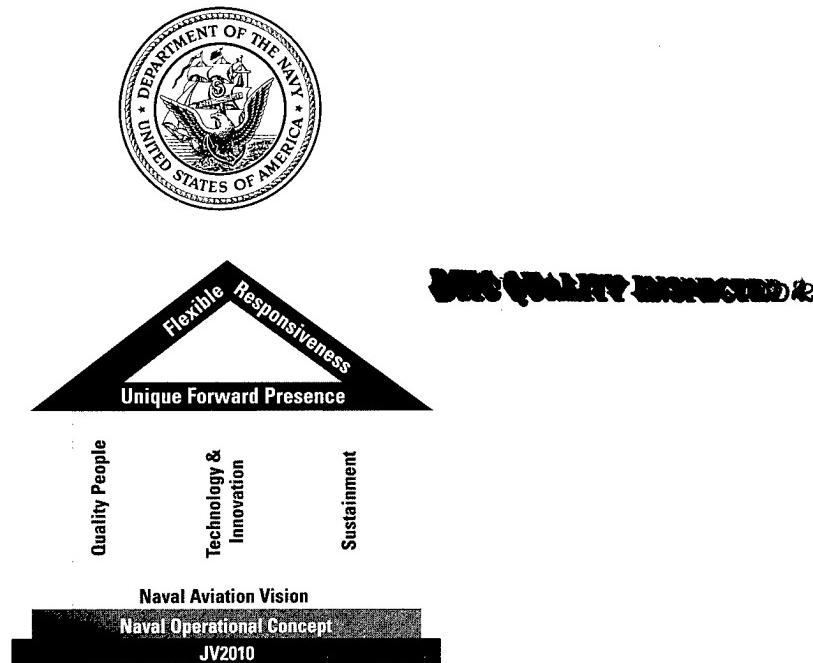
Naval Aviation Vision Statement	Page i
Chief of Naval Operations Foreword	Page ii
Commandant of the Marine Corps Foreword.....	Page iii
Introduction	Page 1
New Challenges..Enduring Realities	Page 4
Naval Aviation: Capabilities for Today... and Tomorrow	Page 7
Sharpening the Vision: The Process	Page 12
Section 1: Element Definitions and Goals	Page 14
Section 2: Program Plans, Descriptions, and Roadmaps	Page 22
Acronyms	Page 74
Director Air Warfare Closing Remarks.....	Inside back cover



NAVAL AVIATION: FORWARD AIR POWER... FROM THE SEA

THE NAVAL AVIATION STRATEGIC VISION AND PLAN

Section 1: Element Definition and Goals



MEMORANDUM FOR DISTRIBUTION

Subj: NAVAL AVIATION LONG-RANGE VISION

Encl: (1) Naval Aviation Vision, Section 1: Element Definitions and Goals

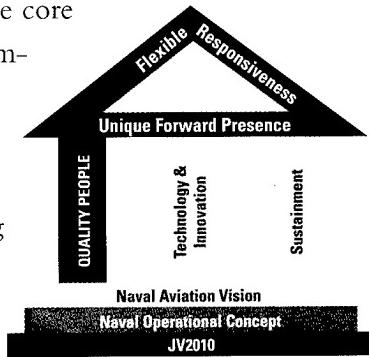
1. The Naval Aviation Vision has been developed, printed, and distributed. I am very pleased to report that the entire process has been conducted in the top down and bottom up fashion we originally intended. The product will be used to focus our current and future efforts to provide for a Naval Aviation capability that will continue to be relevant in the 21st century.
2. From the beginning we have emphasized full Fleet participation in the process of developing Naval Aviation's Vision, and this participation will continue. The Elements and Goals found in Section 1 of the Vision book comprise the heart of our effort — they describe the five critical elements of the Vision and set out the specific goals we must achieve to ensure that these pillars remain strong. They will be updated to track our progress toward meeting the individual goals, again with contributions from all Naval Aviation communities.
3. The Vision book itself has been tailored to the needs of specific users. Not all audiences require the specific substeps and plans that accompany each Vision element and its goals. Consequently, only a consolidated version of Section 1 was included in the book. Enclosure (1) of this letter, which is the complete version of this section, is included as an insert for the benefit of Fleet users. Please retain this document for future reference and to make your inputs into the Vision process.
4. As always, I look forward to your continued participation in the process of making Naval Aviation a dominant force for the 21st century.

DENNIS V. McGINN
Rear Admiral, U.S. Navy
Director, Air Warfare Division (N88)

1. QUALITY AND MOTIVATED PEOPLE

Naval Aviation will comprise the nation's most talented and highly trained personnel. It will be motivated by strong leadership espousing the core values of the Department of the Navy — honor, courage and commitment. Naval Aviation is dedicated to recruiting the best educated and most qualified young men and women to fill the enlisted and officer ranks. Naval Aviation personnel will be technically trained and fully capable of operating and maintaining the most sophisticated aviation weapons and support systems.

Naval Aviation will maintain high retention rates through improved quality of life programs, including educational opportunities, monetary compensation, advancement, and leadership positions.



GOAL 1-1: RECRUITING

Recruit officers and enlisted personnel who meet high academic and physical standards. These personnel will have specific aviation rating and warfare specialty designations requiring subsequent professional training and performance.

SUBSTEPS OR PLANS:

- a. At a minimum, enlisted recruits will be 100 percent high school graduates. Maintain officer accession standards. Quality shall not be sacrificed to meet quotas.
- b. Ensure recruiters meet the highest standards.
- c. Collect feedback on recruit performance.
- d. Develop enhanced accession tools to assist Naval Aviation recruiting efforts.

GOAL 1-2: TRAINING

Ensure that training remains a top priority. Training will be properly resourced to maximize educational technology. "Total system" training for maintenance personnel and aircrews will be an integral part of weapon system acquisition and introduction and subsequent improvements.

SUBSTEPS OR PLANS:

- a. Upgrade current simulator fidelity/realism and maximize use of simulation where it is appropriate to enhance training and readiness.
- b. Maximize value and effectiveness of contractor-provided ground and flight training.
- c. Balance flight hours and simulation to maximize proficiency and readiness.
- d. Ensure aircraft, weapons, and ancillary equipment is procured in ample quantity to support adequate, continual training of operators and maintainers throughout training/deployment cycles.

GOAL 1-3: LEADERSHIP

Instill within the leadership corps those qualities that inspire loyalty, trust, and dedication. These qualities will become institutionalized, emphasized in training, and practiced at all levels within the chain of command.

SUBSTEPS OR PLANS:

- a. Stress ethics (core values) throughout a career.
- b. Give people the authority, responsibility, and accountability (empowerment) at all levels, particularly at the senior enlisted paygrades.
- c. Implement formal leadership training at key career milestones (officer and enlisted).

GOAL 1-4: CAREER DEVELOPMENT AND RETENTION

Provide challenging and rewarding careers and retain qualified personnel. Naval Aviation will give people leadership challenges, advanced educational opportunities, and competitive monetary and benefit compensation.

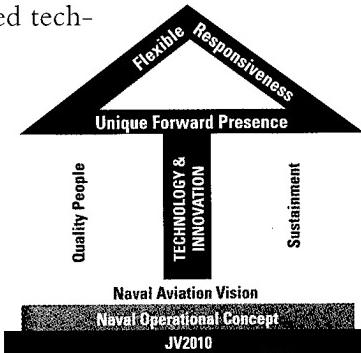
SUBSTEPS OR PLANS:

- a. Coordinate with the Bureau of Naval Personnel to identify aviation pay incentives for officer designators and enlisted rates to improve retention.
- b. Improve predictability of deployment timing and duration.
- c. Redefine Personnel Tempo to include at-sea workups and detachments.
- d. Implement performance and merit-based advancement vice using rating exams as the major determinant for advancement.
- e. Encourage “closed-loop” detailing for specific enlisted aviation rates to improve community maintenance efforts.
- f. Encourage more flexible officer career paths.

2. TECHNOLOGY AND INNOVATION

Naval Aviation will aggressively pursue the application of advanced technology and innovative operational concepts, ensuring the deployment of an affordable, effective force in this era of unpredictable threats. It will:

- Build on proven, existing capabilities, and maintain an environment that supports innovation.
- Partner with industry to leverage Commercial-Off-The-Shelf technology/Non-Developmental Item (COTS/NDI) systems.
- Anticipate exploitation of our emerging technologies by our adversaries.
- Use technology as a force multiplier and a means of reducing costs and improving the effectiveness of all Naval Aviation disciplines, including: Modeling and Simulation (M&S), Information Management, and Life Cycle Management.



GOAL 2-1: TECHNOLOGY EXPLORATION

Pursue a robust Science & Technology (S&T) program supporting near- and long-term Naval Aviation requirements.

SUBSTEPS OR PLANS:

- a. OPNAV (N091), the Office of Naval Research (ONR), and the Naval Air Systems Command (NAVAIR) leverage national and international research and development efforts to gain insight into Department of Defense, National Aeronautics and Space Administration, Defense Advanced Research Projects Agency, and industry technology programs and gain their cooperation in addressing the needs of Naval Aviation.
- b. OPNAV (N88), Fleet commands, NAVAIR, and ONR actively participate in the S&T "round table" process to identify and prioritize S&T requirements. Coordinate to prioritize core S&T programs, Advanced Concept Technology Demonstrations (ACTDs), Advanced Technology Demonstrations (ATDs), and Small Business Innovation Research (SBIR) programs to meet these requirements.
- c. ONR, NAVAIR, and OPNAV work closely with industry to develop S&T proposals that have high payoffs for Naval Aviation.
- d. N88, Marine Corps Deputy Chief of Staff for Aviation (DCS/AIR), NAVAIR, program managers (PMAs), and Fleet commands establish and ensure connectivity with Modeling and Simulation/Wargame groups to more effectively evaluate new ideas.

GOAL 2-2: TECHNOLOGY TRANSITION OPPORTUNITY

Identify transition opportunities to rapidly move new technology into deployable systems for both manned and unmanned platforms.

SUBSTEPS OR PLANS:

- a. PMAs, ONR, NAVAIR, and industry identify transition opportunities and establish roadmaps, processes and investment strategy to rapidly move new technology into deployable systems.

GOAL 2-3: INVESTMENT PRIORITIES

Ensure development priorities and supporting technology insertion roadmaps reflect “true” warfighting requirements.

SUBSTEPS OR PLANS:

- a. OPNAV (N88), DCS (AIR), Fleet commands, and NAVAIR ensure that options for new systems consider “out-of-the-box” concepts, as well as upgrades of current systems. Ensure room for growth is engineered into all new platforms and systems.

GOAL 2-4: INDUSTRY PARTNERSHIP

Effectively couple world-class commercial technology to Naval Aviation acquisition programs.

SUBSTEPS OR PLANS:

- a. Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN (RD&A)) review acquisition policy as it relates to competition and Military Specifications to facilitate innovative use of commercial technologies.
- b. NAVAIR establish and implement policies and procedures for collection, evaluation, and sponsoring of promising industry technical initiatives.
- c. NAVAIR and fleet commanders develop process for review, screening, prioritizing, and testing new technology and COTS/NDI initiatives.
- d. OPNAV and Navy Comptroller (NAVCOMPT) develop more efficient processes to accelerate funding for new technical initiatives.

GOAL 2-5: AFFORDABLE TECHNOLOGY

Apply technology to reduce life-cycle ownership costs of Naval Aviation systems.

SUBSTEPS OR PLANS:

- a. NAVAIR define direct cost of ownership and identify high payoff areas for life-cycle cost savings.
- b. ASN(RD&A), OPNAV, NAVAIR, and NAVCOMPT establish policy that provides incentives for program managers to infuse new technology to reduce life-cycle costs, allowing them to keep part of the savings to meet other program requirements.
- c. NAVAIR, Naval Aviation Inventory Control Point (NAVICP) must make the Logistics Engineering Change Proposal Program work.
- d. ONR, NAVAIR, and industry develop and OPNAV require future concepts and systems definitions that include dramatic improvements in life-cycle costs, including unmanned, “zero maintenance,” and joint common systems.

GOAL 2-6: IMPLEMENTATION/TRANSITION TECHNOLOGY

Ensure training and support systems are in place to accommodate new technology's Initial Operational Capability (IOC).

SUBSTEPS OR PLANS:

- a. N8B, DCS(AIR), NAVAIR, and Fleet commands ensure Operational Requirements Documents and associated acquisition plans reflect that required training and support systems are in place prior to IOC.
- b. ONR, NAVAIR, and Commandant's Warfighting Lab invest in M&S technologies to improve fidelity and reduce the support costs and size of trainers.
- c. ONR, NAVAIR, and Marine Corps Warfighting Lab develop support-systems trainer and simulators which emphasize leading edge technology.
- d. ONR, NAVAIR, OPNAV evaluate ACTDs, ATDs, SBIRs, and Director Defense Research and Engineering Defense Technology Objectives for potential transition candidates.

GOAL 2-7: FOSTER AND REWARD TECHNOLOGY INNOVATION

Foster an environment that encourages creativity and rewards innovation.

SUBSTEPS OR PLANS:

- a. Air Board establish Naval Aviation "strategic planning group" to do "out-of-the-box" thinking to include linking technology and strategy.
- b. ASN(RD&A), ONR, OPNAV, NAVAIR, and NAVCOMPT establish policy that recognizes Integrated Process Team members for innovative ideas and provide incentives to program managers to implement cost savings ideas by allowing them to keep part of the savings to meet other program requirements.

GOAL 2-8: TECHNOLOGY EXPLOITATION

Minimize the effects of reverse technology exploitation by our adversaries.

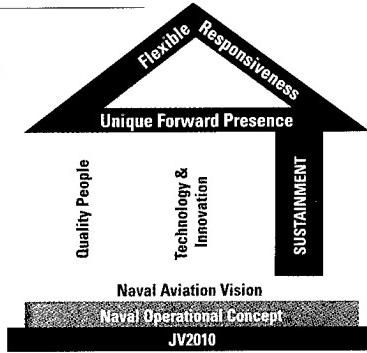
SUBSTEPS OR PLANS:

- a. ONR, NAVAIR, OPNAV, PMAs assess risk of adversary exploitation of commercial/COTS/NDI and new technology systems. (Assess "graceful degradation" of information systems.)
- b. OPNAV, NAVAIR, PMAs, DCS(AIR), and ONR ensure new technology systems contain effective counter-measures or plans to negate or avoid hostile exploitation of new technology/COTS/NDI systems.

3 . S U S T A I N M E N T

Naval Aviation is supported by cost-effective, focused, logistics that ensures a rapid, scaleable response across all mission areas. Naval Aviation will achieve and maintain superior sustainment by:

- Aggressively influencing the acquisition process to achieve maximum weapon system reliability and maintainability.
- Capitalizing on state-of-the-art logistics information technology.
- Decreasing its forward-deployed logistical footprint.
- Skillfully managing integrated logistics support resources for optimum performance.
- Institutionalizing the concept of focused logistics throughout the support community.



GOAL 3-1: HIGH TECHNOLOGY JOINT LOGISTICS

Actively leverage U.S. and international commercial support technologies to achieve a highly focused, "just-in-time" system of logistics that is fully compatible in the joint environment and achieves the highest levels of operational readiness at the lowest possible life-cycle cost.

SUBSTEPS OR PLANS:

- a. OPNAV fund automatic diagnostic and monitoring systems in all aircraft to maximize component part utilization and reduce stocking levels and life-limited parts turnover.
- b. NAVICP reduce the total aviation spares inventory requirement where possible while remaining in consonance with other elements and goals. Improve supply responsiveness by using computerized tracking of parts through the repair cycle and in the warehouse.
- c. NAVAIR and the Naval Supply Systems Command (NAVSUP) develop a joint "just-in-time" logistics/communications system that provides real-time logistics requests, modularized packaging marked for ultimate delivery point, total asset visibility, packaging that allows modular movement and automated handling and processing. This system will also provide for rapid, visible handling of cargo in ships and aircraft (all services). Model industry for inventory tracking and replenishment, and for cargo handling and hub-type operations.
- d. NAVAIR employ non-traditional logistics solutions (e.g., commercial, interservice, and foreign) using incentives and rewards.

GOAL 3-2: SYSTEM DESIGN RELIABILITY IMPROVEMENTS

Demand superior weapon system reliability and maintainability as design objectives on all new and modified weapon systems. The reliability of all fielded weapons will be continuously monitored. Maintenance plans and processes will be updated, as needed, to ensure that inherent hardware design reliability is maintained in the field.

SUBSTEPS OR PLANS:

- a. Systems Commands identify weapon systems that are experiencing premature operational failures and sponsor reliability improvement modifications needed to reduce the readiness and cost-of-ownership burden, and to fully support reliability-centered maintenance.
- b. Systems Commands influence the emerging design of new weapon systems to eliminate, reduce, or simplify the requirement for maintenance. Ensure systems engineering trade studies balance design reliability with life-cycle cost.

GOAL 3-3: SUPPLY TRANSPORTATION

Ensure that materiel delivery systems of the future are highly efficient and effective, fully integrated in the carrier battle group/amphibious ready group and joint-service environment, and possess sufficient speed, capacity, and reach to support the most demanding operational scenario.

SUBSTEPS OR PLANS:

- a. NAVSUP and Type Commanders exploit all sources of materiel and logistics routing to keep the Navy as a uniquely self-sufficient force.
- b. Systems Commands support underway delivery systems that are fully responsive to Naval Aviation needs. Ensure continuous and capable on-board delivery assets.

GOAL 3-4: MANAGEMENT METRICS

Develop and implement a system that measures aviation support costs at all levels. The system will provide the management information needed to make targeted spending adjustments, resulting in the maximum readiness of forward-deployed forces at minimum cost. Seek continual process improvement at all levels of aviation maintenance and repair.

SUBSTEPS OR PLANS:

- a. OPNAV and Systems Commands implement a standardized metric for measuring the effectiveness of Naval Aviation logistics support. Relate the level of resources spent on aircraft support to the quality of support actually experienced in the Fleet.

Study existing metrics for applicability and incorporate “best of breed”. Modify readiness updating incentives to generate more accurate identification of customer needs.

- b. OPNAV, Type Commanders, and Systems Commands consider life-cycle cost as a driving factor in the success of any weapons program. Make necessary near-term investments to achieve out-year savings.

GOAL 3-5: MANPOWER AND TRAINING

Optimize the effectiveness of support personnel by fully capitalizing upon technical advances in diagnostic tools, training, and repair processes. Valuable technician knowledge and experience will be carefully protected through innovative personnel management.

SUBSETS OR PLANS

a. Improve the technical skills of aviation maintenance personnel:

1. Chief of Naval Education and Training institute a program of modularized, "just-in-time" training for entry level maintenance personnel and follow-on skills progression training. Consolidate training by skill-set categories, such as all hydraulics, all avionics, or all engine mechanics, instead of by type/model/series-driven categories. The resulting reduction in time-to-train would enable maintenance personnel to start gaining experience sooner, while simultaneously increasing the staffing of Fleet squadrons.
2. Systems Commands oversee development and use of smart diagnostics/ hand-held computerized maintenance aids.
3. Bureau of Naval Personnel implement closed-loop detailing.
4. Air Type Commanders fully integrate Naval Reserve personnel and equipment.

GOAL 3-6: SURGE/MOBILIZATION

Work in full partnership with industry to preserve a commercial industrial base that has a robust "just-in-time" capability, has the capacity to meet contingency surge mobilization requirements, and retains its long-term technical viability.

SUBSETS OR PLANS:

- a. NAVAIR conduct a study to assess industrial base capability to meet surge mobilization requirements for Naval Aviation.
- b. Systems commands establish a mechanism to manage industrial supplier capability to protect Naval Aviation needs.

GOAL 3-7: COMMERCIAL SOURCING

Ensure that, when Commercial Off-The-Shelf technology is employed in aircraft and weapon systems, effective, economical, and fully responsive life-cycle support is also provided.

SUBSETS OR PLANS:

- a. Systems Commands train personnel on how to integrate and use non-traditional, Commercial Off-The-Shelf products routinely.
- b. ASN (RD&A) ensure the acquisition community determines a proper level of life-cycle support before approving of commercial alternatives.

- c. Systems Commands investigate the ability of incorporating "partnership incentives," despite an acquisition process that encourages lowest bidder.

GOAL 3-8: COMMON HARDWARE CONFIGURATION

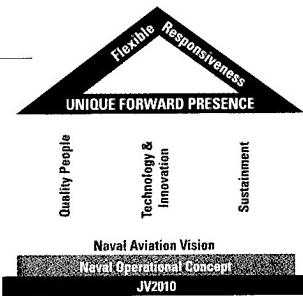
Fully exploit the areas of weapon system and repairable component commonality in order to reduce the total forward-deployed, joint service logistical footprint.

SUBSETS OR PLANS:

- a. OPNAV neckdown the number of aircraft types/models/series in the Naval Aviation inventory by supporting current long-range plans such as the Common Support Aircraft and the Helicopter Master Plan.
- b. OPNAV migrate from multiple, single-mission platforms to consolidated, multi-mission platforms.
- c. Systems Commands use common modular components in Naval Aviation platforms, systems, and weapons.
- d. Systems Commands prepare detailed plans for hardware and software neckdown and standardize replacement of obsolete components.

4. UNIQUE FORWARD PRESENCE

Naval Forces, unencumbered by the dictates of a host nation and the politics of gaining access ashore, will continue to provide responsive independent strike, precision, depth-of-influence, and maneuver capabilities. This timely and sustainable sea-based presence provides ready, visible, and scaleable response to uncertain humanitarian, political, and military crises.



GOAL 4-1: ENHANCED FORWARD PRESENCE

Recognizing changing geopolitical and economic priorities, enhance Naval Aviation's worldwide forward presence through multinational exercises, port visits, foreign military training, and representation on allied staffs. These activities, plus the active efforts of personnel assigned to overseas naval air installations, are meant to provide timely and sustainable on-scene protection of U.S. national interests, and foster closer relationships with our friends and allies.

SUBSTEPS OR PLANS:

- a. Continue development of multi-mission aviation platforms to allow flexible positioning of forward presence aviation forces in response to changing geopolitical/economic concerns.
- b. Increase Department of the Navy (DoN) funding to aviation, surface, and Marine forces involved in forward presence roles.

GOAL 4-2: SUPPORT

Achieve a level of support abroad and throughout the nation, Congress, Department of Defense, and other federal agencies that ensures viable, efficient, and affordable forward presence.

SUBSTEPS OR PLANS:

- a. Develop a revolutionary plan to educate the public, academia, and Congress and to promote Naval Aviation as a viable, efficient, and cost-effective forward presence.
- b. Emphasize the support DoN forward presence forces provides to the Department of State and warfighting Commanders-in-Chief (CINCs).
- c. Develop a sound basis to justify readjusting current total obligation authority to reflect a greater DoN role in execution of National Military Strategy.

GOAL 4-3: RESOURCES

Define and provide sufficient resources to support and sustain forward presence in all areas dictated by our national interests.

SUBSTEPS OR PLANS:

- a. Define adequate and balanced aviation force structure for all air-capable platforms (carriers, surface combatants, and amphibious ships) which will meet forward presence requirements.
- b. Consider alternative methods to optimize the forward presence mission including forward basing, pre-positioning, cruise length, and crew rotation (ship, squadron, detachment).
- c. Maintain a balanced investment strategy that provides an adequate procurement, upgrade, and replacement program for all Naval Aviation forward presence units.
- d. Identify, develop, and adopt mechanisms that offer Naval Aviation greater access to Reserve Forces for forward presence missions and allow greater availability of Reserve Forces.

5. FLEXIBLE RESPONSIVENESS

Naval Aviation will provide the National Command Authority with a range of capable, credible, and scaleable options ranging from non-lethal deterrence to rapid, precise, and decisive engagement. Expeditionary in nature, Naval Aviation provides a wide spectrum of unique capabilities able to adapt to changing geopolitical realities.

GOAL 5-1: DOCTRINE/TRAINING

Provide the doctrine and training necessary to successfully respond to National Command Authority tasking across the complete spectrum of conflict.

SUBSTEPS OR PLANS:

- a. Integrate Navy and Marine Corps doctrine, operational training, and requirements generation into a single Naval Command.
- b. Continue development of doctrine and operational training requirements for Military Operations Other Than War, emerging missions, and joint operations.
- c. A single Naval Command will be responsible for the aviation operational training continuum. This command must revolutionize training philosophy as part of reorganization, emphasizing the following: linking training to doctrine, missions and tasks, and reporting measures of training effectiveness vice “readiness.”
- d. Develop high-fidelity, linked simulations for cockpit and tactical training systems and real-time, full-scenario observation and reconstruction.
- e. Expand and protect our training investment to include training ranges, Non-Combat Expenditure Allowance and joint tactical training systems.

GOAL 5-2: COMMAND, CONTROL, COMMUNICATION, COMPUTERS, INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (C4ISR)

Provide the situational/battlespace awareness and command and control systems, using joint, open, and flexible architecture to enable efficient and effective employment of resources.

SUBSTEPS OR PLANS:

- a. Involve industry in the accelerated development and procurement of open architecture systems that meet joint standards and can be upgraded.
- b. Leverage COTS technology to develop high-capacity memory, processing, and communications systems that are lightweight, affordable, and ruggedized.
- c. Field sufficient quantities of C4ISR systems to ensure that cross-decking of assets is not required.
- d. Ensure that fielded systems are redundant and capable of graceful degradation.

- e. Develop information management architecture and man-machine interface to improve data fusion, multi-spectral combat ID, and dissemination and display for all mission areas. The architecture should include near real-time dissemination to the lowest level of the net. Exploit joint systems to obtain dominant battlespace awareness.
- f. Develop systems which provide real-time or near real-time tactical intelligence of the battlespace. Explore the potential role of unmanned aerial vehicles (UAVs) in ISR collection.

GOAL 5-3: MOBILITY

Enhance mobility to enable the rapid concentration of forces and fires in keeping with the strategic concepts of *Forward... From the Sea*.

SUBSTEPS OR PLANS:

- a. Optimize the responsiveness, range, payload, accuracy, survivability, and lethality of aviation weapon systems in all weather conditions and for all mission areas, day or night.
- b. Optimize the speed and the aircraft compatibility and capacity of the Naval Expeditionary Force surface platforms that support aviation expeditionary operations.

GOAL 5-4: MUNITIONS

Provide munitions and weapon systems that will enable naval forces to respond across the full spectrum of conflict.

SUBSTEPS OR PLANS:

- a. Implement a neckdown in types of weapons. Procure balanced weapons capabilities in response to the threat (Air-to-Air, Air-to-Ground (Precision-Guided Munition/Level of Effort), Undersea Warfare).
- b. Continue to explore UAV applications for weapon delivery.
- c. Provide weapon systems that are applicable to the low end of the conflict scale, including non-lethal weapons.
- d. Provide weapons suitable for use in fighting in urban terrain.
- e. Provide mission-planning systems with enhanced geographic location capability and that are capable of supporting the precision employment of weapons.

GOAL 5-5: JOINT

Ensure our core competencies are developed and maintained to be able to respond to the National Command Authority's tasking.

SUBSTEPS OR PLANS:

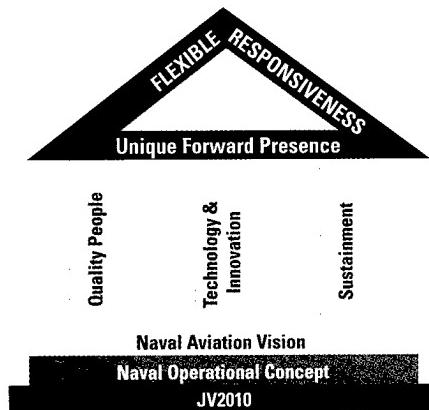
- a. Identify and man billets for exchange tours on Naval Expeditionary Force battle staffs.
- b. Organize and train battle group staffs to support all joint functional tasking.
- c. Provide command ship (CVN, CV, LHD, LHA, LCC, and AGF) infrastructure to support Joint Task Force command and control requirements.

GOAL 5-6: BATTLESPACE DOMINANCE

Ensure a balanced investment in the Navy-unique warfighting capabilities needed to achieve battlespace dominance at sea and in the littoral.

SUBSTEPS OR PLANS:

- a. Improve low-observable engagement capability.
- b. More fully integrate aviation into force protection plans for theater missile defense, including Cooperative Engagement Capability and attack operations.
- c. Provide a layered, organic anti-submarine detection-and-kill capability in littoral environments.
- d. Provide organic mine detection, avoidance, and clearing capability.
- e. Improve sea control capabilities in the crowded and complex near-shore environment.
- f. Improve air defense suppression capability against mobile and relocatable surface-to-air threats.
- g. Provide layered airspace dominance in the littoral environment.



Chief of Naval Operations
Director, Air Warfare
Pentagon, Washington, DC 20350-2000
703-693-2625 DSN 223-2625

INTRODUCTION

When Eugene Ely flew his Curtiss biplane from a wooden platform mounted above the bow of USS *Birmingham* in November 1910, and when 1st Lieutenant Alfred A.



Cunningham, Marine Aviator Number One, climbed into the cockpit of his leaking Wright hydroplane two years later, no one could imagine that in another 87 years Naval Aviation would stand at the dawn of a new century with power and expeditionary capabilities unmatched by any other force.

The first decades of the 20th century were times of significant change and innovation for the Navy and Marine Corps, as aviation began to make its presence felt in naval and expeditionary operations. The first decades of the 21st century will continue to see change and innovation brought on by an evolving strategic environment, new operational concepts, and advances in aircraft, weapons, and information technologies. Naval Aviation is adapting to new circumstances, even in this period of constrained defense spending. This is an imperative that cannot be avoided, because the importance of naval power to U.S. strategy and the importance of Naval Aviation to U.S. naval operations are as great as ever. In a world in which the United States has vital interests overseas, Navy and Marine Corps forces provide key forward-presence, crisis-response, and warfighting capabilities to our nation's leaders and joint commanders. Naval Aviation plays a central role in every naval mission, from establishing battlespace dominance to projecting power ashore.

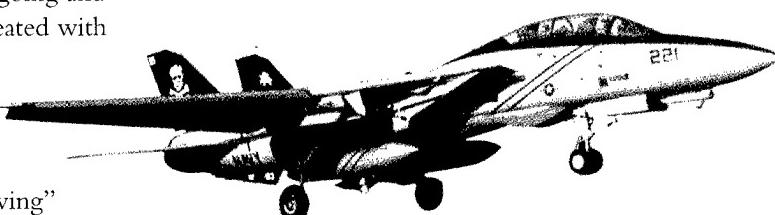
As Naval Aviation modernizes itself for operations in the next century, it requires an integrated roadmap that charts where it is going and how it intends to get there. Created with continuous inputs from all the communities that comprise Naval Aviation, this Strategic Vision and Plan will serve as that roadmap. It is a "living" document that will be updated and adjusted over time to reflect operational, technological, and programmatic changes. It will also continue to be a focal point around which Naval Aviation develops a consensus on its future direction.

The objectives of this publication are to describe the Naval Aviation Vision and its supporting elements, process, and programs and to tell the story of a dynamic and dedicated warfighting team. The book is divided into three major parts:

The Introduction includes an overview of the enduring realities faced by Naval Aviation, a review of Naval Aviation's components and their roles, the Naval Aviation Vision statement and its structure, and a description of the process used in its development.

Section 1 presents the basic elements, and their supporting goals and objectives, that comprise the Naval Aviation Strategic Vision.

Section 2 describes specific programs and roadmaps that form the Strategic Plan.



New Challenges... Enduring Realities

As the world continues to change rapidly, it is essential for us to remain adaptable and innovative in our approach to business. In this dynamic environment, we must constantly seek out new challenges and opportunities to drive growth and success. At the same time, it is important to remember that some fundamental realities of business remain constant, such as the need for strong leadership, effective communication, and a focus on customer satisfaction.

One key challenge facing businesses today is the rapid pace of technological advancement. With new technologies emerging all the time, it can be difficult to keep up and stay competitive. However, embracing change and investing in new technologies can also open up exciting new opportunities for growth and innovation. This requires a willingness to take risks and experiment, while also being prepared to learn from mistakes and adjust course as needed.

Another challenge is the increasing global competition. As more companies from around the world enter the market, it can be challenging to stand out and differentiate ourselves. To succeed in this environment, it is essential to have a clear understanding of our strengths and weaknesses, and to develop a strategy that leverages our unique value proposition. This may involve expanding into new markets or partnerships, or focusing on specific niches where we can gain a competitive edge.

Despite these challenges, there are also many enduring realities that remain true in business. One of these is the importance of strong leadership. A leader who is visionary, decisive, and ethical can inspire and guide a team towards success. Another reality is the need for effective communication. Clear and concise communication is crucial for building trust, fostering collaboration, and ensuring that everyone is aligned towards a common goal. Finally, customer satisfaction remains a cornerstone of successful business. By prioritizing the needs and preferences of our customers, we can build strong relationships and loyalty that will drive long-term success.

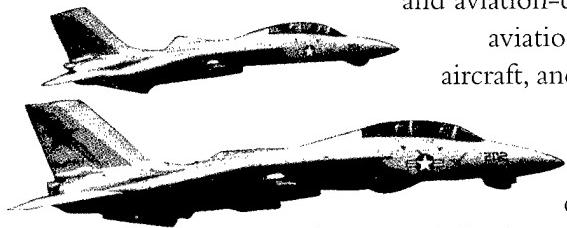
In conclusion, while the business landscape is constantly evolving, there are still fundamental truths that apply across all industries. By embracing new challenges and adapting to change, while also acknowledging and honoring enduring realities like strong leadership and customer satisfaction, we can position ourselves for success in the years ahead.

“The future belongs to those who believe in the beauty of their dreams.” —Walt Disney

For more than two centuries, the United States has depended upon its Navy-Marine Corps team to carry out missions across the entire spectrum of peace, crisis, and war. Together, the nation's Naval Services provide a tremendously versatile and unique warfighting capability.

NEW CHALLENGES . . . ENDURING REALITIES

Naval forces have the ability to go anywhere rapidly, remain on station for indefinite periods of time using sea-based logistics support, and project effective military power across any shore and against any adversary. Naval Aviation forces — aircraft carriers and aviation-capable amphibious ships with their embarked air wings and aviation combat elements, land-based maritime patrol and support aircraft, and helicopters operating from surface combatants and auxiliary ships — are linchpins of U.S. naval power.



Much has changed in the past 200 years, and change continues to accelerate as we approach the 21st century —

the strategic landscape in 1997 is dramatically different from the height of the Cold War. All that acknowledged, there are several enduring realities that must be understood to ensure that Naval Aviation's foundation remains relevant to meet the challenges ahead.

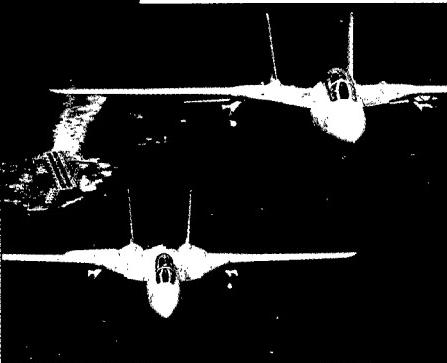
NAVAL POWER'S CRITICAL ROLES

All of America's armed forces make valuable contributions to protecting U.S. interests, citizens, and friends wherever and whenever they might be at risk. But the Navy-Marine Corps team — and naval air power — play a unique role. The United States is a maritime nation with vital national interests which depend upon the nation's ability to control the seas. In the wars and conflicts in which the United States found itself engaged during the 20th century, typically more than 95 percent of all material and equipment needed for victory went by sea. This will continue to be the case, and the United States will continue to require seaborne access throughout the world — access that can only be assured by robust naval forces.

U.S. naval forces also possess extraordinary strategic reach, and the daily operations of America's Sailors and Marines have the potential to affect the majority of the world's inhabitants. Seventy-five percent of the earth's population and a similar proportion of national capitals and major economic centers lie in the littorals. This means particularly that Naval Aviation's expeditionary operations from the sea provide the United States with an enduring and decisive capability to shape and influence events on land.

In the 1992 strategic concept paper, ...*From the Sea*, the Navy and Marine Corps confirmed the primacy of littoral operations and the need to influence and control events on the shore. In 1994, *Forward...From the Sea* refined even more the naval strategic vision and highlighted the vital role of forward-deployed forces in underwriting regional stability. One of the most critical advantages of naval forces is that they provide on-scene deterrence, sea control, and power projection capabilities, and do so without infringing upon any nation's sovereignty. This





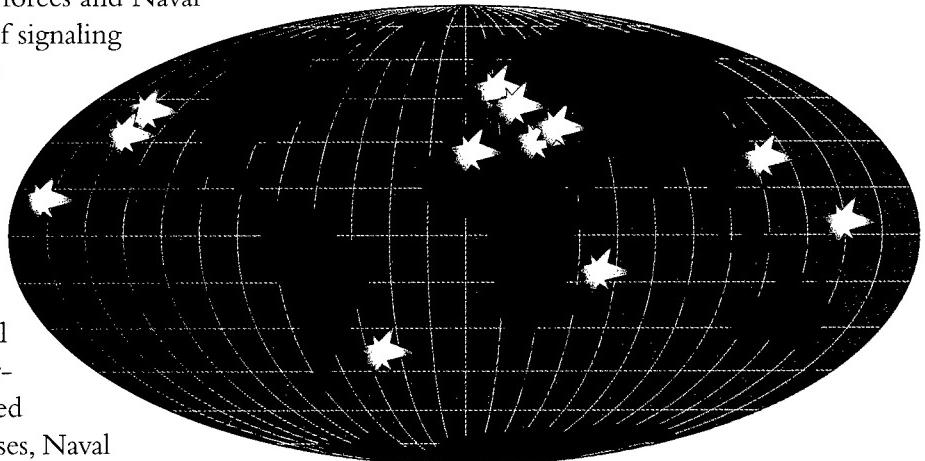
advantage exists because naval forces operate in international waters and enjoy freedom of movement throughout the high seas.

This forward-deployed posture contributes significantly to regional deterrence and our ability to project military power when and where it is needed. Regional political and military elites — our friends and adversaries — must always be mindful of the military capabilities residing in an aircraft carrier battle group (CVBG) or amphibious ready group (ARG) that remains just offshore, waiting for the President's direction. These routine and sometimes not-so-routine deployments to forward areas also provide the basis for projecting and sustaining military power in regional conflicts, for ensuring full-spectrum dominance of the littoral battlespace, and for securing lodgments to enable entry of land-based forces.

THE REQUIREMENT FOR EFFECTIVE CRISIS RESPONSE

During the Cold War, from 1946 through 1989, the Navy-Marine Corps team responded to some 190 crises, about one crisis-response operation every 11 weeks. In about 80 percent of these situations, the focus of the U.S. response was an aircraft carrier battle group, an amphibious ready group, Marine Corps aviation, or land-based naval air power. In the 1990-1997 period, the Navy and Marine Corps have been called upon to respond to crises and combat in over 75 instances, or one crisis response every 3 1/2 weeks — more than double the Cold-War rate. Again, Naval Aviation has played a central role in most of these cases.

Thus, forward-deployed naval forces and Naval Aviation are a superb means of signaling U.S. capabilities and resolve to friends and foes alike. Not constrained by host-nation political restrictions, the deployment of naval forces is not subject to a foreign veto. In times of tension or conflict, tactically mobile naval forces do not present an adversary with large, vulnerable, fixed targets. Operating from sea bases, Naval Aviation can reach littoral trouble-spots quickly, provide self-sustained, long-range operations for extended periods of time, and move at a moment's notice to respond to newly emergent requirements. By its very nature, sea-based aviation allows the nation's leaders to react to events in a measured but militarily significant manner, increasing or decreasing the weight of their presence as events ashore dictate.



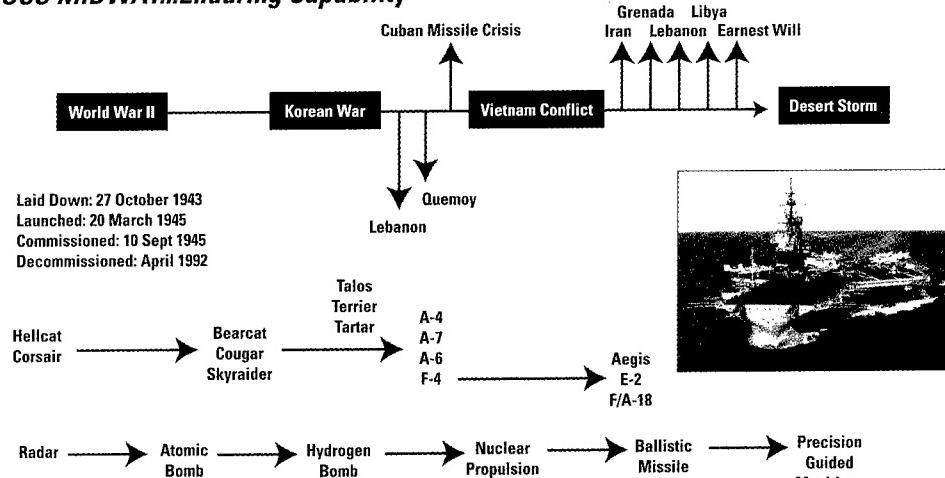
CONTINUING ADVANCES IN MILITARY TECHNOLOGY

The swift and decisive victory of the United States and its allies in the 1991 Gulf War gave the world its first glimpse of an emerging method of warfare, one in which new technologies and operational concepts could lead to significant advances in warfighting capability. Naval Aviation is taking full advantage of ongoing technological and doctrinal innovation that will be the basis for operational excellence in the next century. Naval Aviation's leadership will remain ready to adapt to new imperatives of warfare, including the prospects that future adversaries will harness technologies and approaches that may not be symmetrical to ours. We must be ready to ensure that we — not our foes — enjoy the advantage of operational and technological superiority.

The Chairman of the Joint Chiefs of Staff explained his vision of America's future military in *Joint Vision 2010*. Four fundamental operational concepts — dominant maneuver, precision engagement, focused logistics, and full-dimensional protection — serve as the foci for the development of all joint warfighting capabilities. Importantly, these four operational concepts are already embodied to a large degree in America's expeditionary naval air power. But we cannot stand still.

Innovation and change have been the watchwords of Naval Aviation since its earliest days. The ability to adapt to new technologies, systems, platforms, and operational needs is nowhere better exemplified than in the design and 50-year operational history of the USS *Midway* (CV 41). Designed during World War II, in 1945 this "flattop" initially operated piston-driven propeller aircraft, yet returned from her last

CVBGs ARE COST EFFECTIVE *USS MIDWAY..Enduring Capability*



A 50-Year Investment in U.S. Security

1943 → 1992

deployment in 1991 with the Navy's most modern, multipurpose strike-fighters. Her original axial-deck design was modified to an angled-deck layout, her original hydraulic catapults were replaced with more powerful steam catapults, and the most basic electronics replaced by advanced sensors and communications equipment. Indeed, every time a carrier deploys it carries leading-edge systems that — when combined with effective tactics and well-trained people — ensure it can meet almost any warfighting requirement.



Naval Aviation's future will build upon this heritage of innovation and tactical and operational excellence. From the next-generation aircraft carrier, to advanced multi-mission aircraft such as the Joint Strike Fighter and the Common Support Aircraft, to tilt-rotor aircraft, Naval Aviation's Vision is one of adaptation, evolution, and success.

NAVAL AVIATION: CAPABILITIES FOR TODAY... AND TOMORROW



U.S. Naval Aviation is a multifaceted and versatile warfighting team, consisting of Navy and Marine Corps people, aircraft, organizations, and facilities. Operating from sea and shore bases, Navy and Marine Corps aviation performs a wide range of missions throughout the world. In combination with cruise missile-equipped ships and submarines and the ground combat and combat service support elements of Marine Air-Ground Task Forces (MAGTFs), Naval Aviation can project decisive, dominant military power from the sea.

NAVY SEA- AND LAND-BASED AVIATION

Within Naval Aviation, the Navy possesses a large and varied force of combat and support aircraft. Whether sea- or land-based, the Navy's aviation communities and their aircraft are key elements in the service's ability to achieve its operational and tactical objectives. Most U.S. Navy ships have the capability to support air operations and all naval vessels can be serviced by helicopters.

Carriers and Carrier Aviation

Experience shows overseas presence — being there — is clearly the best way to do business. In regions where the United States has significant interests, it is imperative that the United States provide tangible evidence of its commitment, and the means to defend those interests. Our presence and crisis-



response centerpiece continues to be the aircraft carrier. The aircraft carrier is a self-contained, self-supporting system that is ready for action immediately upon arrival in crisis areas, independent of overseas bases, infrastructure, or the permission of foreign governments.

Carrier aviation stands ready to provide offensive air support to Naval Expeditionary Forces. If elements of a MAGTF are conducting operations ashore, Naval Aviation's advanced surveillance capabilities and offensive and defensive technologies allow it to provide close air support to Marines operating far beyond yesterday's beachheads.

Currently, the Navy operates 12 carriers (11 active and one operational reserve), plus ten active and one Naval Air Reserve carrier air wings. These are multi-purpose wings, consisting of strike-fighter, reconnaissance, surveillance, electronic combat, anti-submarine, tanker, and search-and-rescue capabilities. In the coming years, carrier aviation's capabilities will increase, even as the composition of its air wings change. The Navy is in the process of "necking down" the number of aircraft types that fly from carrier decks. Instead of flying a larger number of aircraft types, each optimized for a narrow range of missions, the service is moving toward a smaller force that consists of more capable and more lethal multi-mission aircraft. And it is not only carrier air wings that are changing — the sea bases from which they operate continue to evolve as well. Over the next decade and a half, the Navy will make the transition from today's *Nimitz*-class carriers to a new carrier class that builds upon new technologies and concepts. The ships of this class will be in service well past the mid-point of the 21st century.



Surface Combatants and Naval Aviation

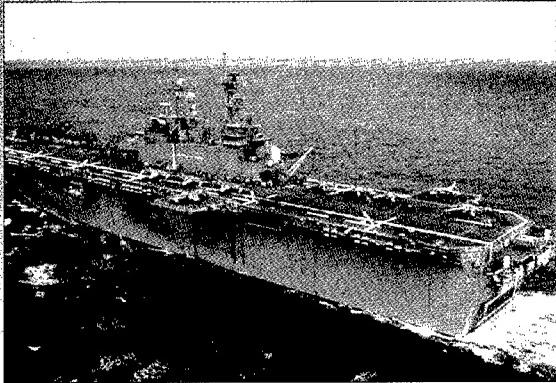
Surface combatants such as cruisers (CG and CGN), destroyers (DD and DDG), and frigates (FFG) are capable of launching and recovering the SH-60B Seahawk and other helicopters.



Naval Aviation extends the sensor range of these ships, which in turn enhances the capability of shipboard weapons systems. The Light Airborne Multi-Purpose System (LAMPS) combines the SH-60B Seahawk with computer-integrated shipboard equipment to expand the range and capabilities of surface combatants for antisurface warfare (ASUW), undersea warfare (USW), surveillance, and targeting missions. The tactical options generated by the real-time exchange of data between warships and these helicopters give naval commanders greatly enhanced ability to control the battlespace, especially in crowded littoral regions.

Amphibious Warfare Ships and Naval Aviation

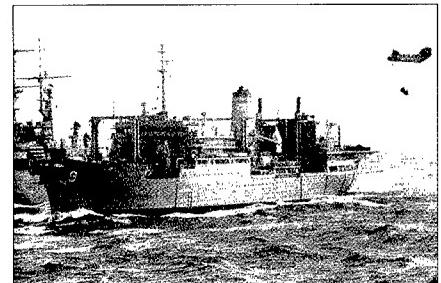
Amphibious warfare ships are capable of recovering and launching aircraft such as the AH-1W, UH-1N, CH-46E Sea Knight, the H-53 Super Stallion/Sea Dragon, the AV-8B Harrier II, and the MV-22 tilt-rotor Osprey.



The CH-46E Sea Knight is the Marine Corps major troop and supply, ship-to-shore, transport aircraft. The Marine Corps CH-53E Super Stallions provide a heavy-lift troop and supply transport capability, while UH-1N Hueys perform utility, command-and-control, and other duties. The Navy's MH-53E provides an airborne minesweeping capability. AV-8B Harriers and AH-1 Cobras provide offensive air support and helicopter escort for the MAGTF. The MV-22 Osprey will have the ability to transport 24 combat-equipped Marines, or a 10,000-pound external payload, 2,100 nautical miles with just one aerial refueling. This surface ship/aviation team greatly enhances the ability to conduct Operational Maneuver from the Sea (OMFTS).

Logistics Ships and Naval Aviation

The Navy's large logistics ships are capable of launching and recovering all vertical take-off and landing aircraft in the naval inventory. Logistics ships with their aviation ability are an integral part of the Navy's self-sustainment capability. Aircraft such as the Navy's CH-46D Sea Knight, the airborne workhorse of the fleet, provide replenishment of supplies and munitions in all weather, day or night. This capability gives the battle group the ability to operate without depending upon a politically or militarily vulnerable shore-based infrastructure.



Command and Control Ships and Naval Aviation

Command and control ships such as the USS *Mount Whitney* (LCC 20) are capable of handling aircraft up to and including the H-53 Super Stallion/Sea Dragon and the V-22 Osprey. This air capability provides the Fleet Commander or Joint Force Commander with the capability to rapidly and efficiently move people and equipment to places in-theater, where and when they are needed, in an ever changing environment.

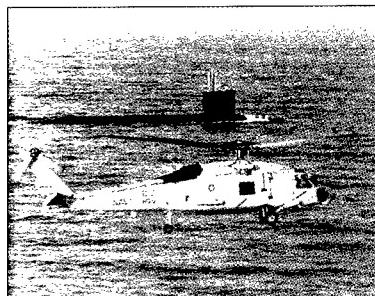


Maritime Patrol Aviation

The maritime patrol force is a land-based facet of naval air power, having global reach while still maintaining a small logistical "footprint." With their ability to conduct ASUW, USW, surveillance, and mining operations, forward-deployed P-3C aircraft



provide continuous, multi-mission support to joint task forces and naval task groups at sea. Operating in support of carrier battle groups, surface action groups, and amphibious task forces — or independently — these aircraft are an important, flexible element in our naval forward presence posture. Their Tactical Support Centers are also a critical component in the Navy's integrated, worldwide network of maritime command and surveillance centers.



Special-Purpose and Support Aviation

The Navy also operates specialized fixed-wing and helicopter squadrons that support a variety of naval and joint activities. These include electronic intelligence collection aircraft, strategic communications command/relay aircraft, minesweeping helicopters, and various types of cargo, passenger, and vertical replenishment fixed- and rotary-wing aircraft. Most of these squadrons are active-duty commands; several are composite active-reserve, or reserve squadrons.

Training

Naval Aviation trains Navy and Marine Corps aviators and naval flight officers, along with Coast Guard aviators, select naval aviators from allied countries, and certain U.S. Air Force personnel. It also maintains a school system to train the enlisted personnel that will maintain aircraft and support Navy, Marine Corps, and Coast Guard flight operations. From bases located primarily in the southern and southeastern United States, Naval Aviation produces the finest aviators, naval flight officers, enlisted air-crew, and support personnel in the world.

MARINE CORPS AVIATION

The Marine Corps tailored organization for combat, the Marine Air-Ground Task Force, exploits the synergy inherent in closely integrated air and ground operations. Effectively blending infantry forces, artillery, armor, and tactical aviation, the MAGTF generates maximum combat power with the minimum logistical footprint. Each MAGTF is an integrated combined-arms team.

Naval Aviation supports the MAGTF in six functional warfare areas: offensive air support, anti-air warfare, assault support, air reconnaissance, electronic warfare, and control of aircraft and missiles. To perform these missions, the Marines require several different types of aircraft, both fixed- and rotary-wing, and unmanned aerial vehicles (UAVs), as well as the support equipment to maintain and control them.

Marine aviation, as the landward extension of Naval Aviation, can readily and routinely transition between sea bases and shore bases without substantial loss of



capability. Presently, Marine aircraft are deployed on board amphibious ships as part of the Marine Expeditionary Unit (Special Operations Capable), or MEU(SOC), and with several carrier air wings embarked on carriers. Transition from sea-basing to land-basing is not dependent upon the availability of established aviation facilities; the Marine Corps expeditionary airfield (EAF) system allows committed forces to rapidly construct and operate stand-alone airfields. Marine squadrons have also been forward-deployed to and operated from conventional land bases (such as Aviano, Italy). The transition from sea to shore is further enabled by the MAGTF's expeditionary command, control, communications, computers, and intelligence capability.

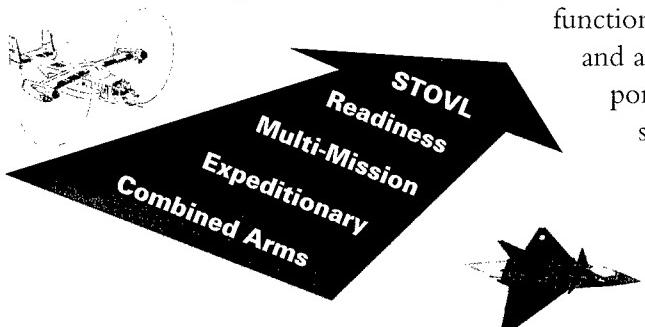
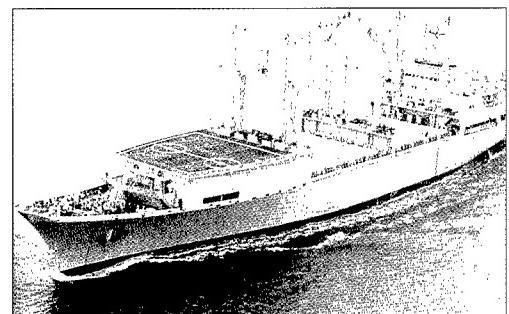
The logistical support needed to sustain Marine aviation ashore for extended periods in austere theaters is embarked aboard two Aviation Logistics Support Ships (TAVBs). These ships are maintained in the Ready Reserve and are used to transport critical intermediate-level maintenance and supply support to a forward operating area. This ability to sustain the aircraft ashore is augmented by the Maritime Prepositioned Force (MPF), which provides the ordnance necessary to prosecute the campaign. Together the TAVB and MPF provide the warfighting Commanders-in-Chief (CINCs) with logistical leverage because of their varied employment and mobility options.

In order to enhance Marine aviation's role in MAGTF expeditionary operations, the Commandant of the Marine Corps has set a goal to reduce the number of models of aircraft that are being operated. An additional objective of this process is to achieve the vision established by an earlier Commandant, General Randolph Pate, in 1957 — an all short takeoff/vertical landing (STOVL) aviation component. This transition will be accomplished while ensuring that state-of-the-art capabilities are maintained in the required

functional areas. Modernization initiatives to enhance night and adverse weather effectiveness, to improve aircraft portability, reliability and maintainability, and to reduce strategic lift dependency also remain essential to the fulfillment of our warfighting requirements.

As formally articulated in law by Congress in 1952, *"The Marine Corps, within the Department of the Navy, shall be so organized as to include not less than three combat divisions and three air wings, and such other land combat, aviation, and other services as may be organic therein."*

The Marine Corps shall be organized, trained, and equipped to provide Fleet Marine Forces of combined arms, together with supporting air components, for service with the fleet in seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign."

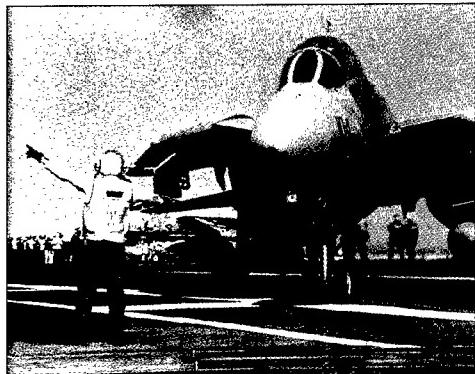


SHARPENING THE VISION: THE PROCESS

Naval Aviation encompasses a broad array of communities and capabilities, all working toward a common end. With the approach of the next century, it is important that we also have a specific, common vision, an understanding of where we are going and how we will get there. To accomplish this, we developed a process that integrates the concerns and views of Fleet commands throughout Naval Aviation.

DEVELOPING A CONSENSUS

The process began in earnest with the first of three Fleet off-site conferences in July 1996, followed by sessions in October 1996 and January 1997. The participants in these conferences represented a true cross-section of Naval Aviation — strike-fighter as well as resupply and logistics support, Marine and Navy, fixed- and rotary-wing, and shore- and sea-based senior Fleet operators. In these sessions, the participants reviewed the direction provided by our National Military Strategy, analyzed requirements with respect to *Joint Vision 2010*, integrated the vision of the Chief of Naval Operations and the Commandant of the Marine Corps, and assessed the geopolitical, economic, and technological future. The attendees also evaluated the scenarios that Naval Aviation will face which reflect the changing missions identified in *Joint Vision 2010* and *Forward... From the Sea*.



Forward... From the Sea. These scenarios include peacetime engagement, deterrence and conflict prevention, and winning in a range of conflicts.

From the beginning, the process has been emphasized just as much as the final product. The involvement of Fleet representatives in the three off-site sessions has been particularly critical. The plan they developed will underpin the Naval Aviation resource and procurement decisions for the foreseeable future. A broad focus was maintained throughout this effort to ensure that every aspect of Naval Aviation, from people to weapons systems to logistics, was addressed appropriately and in sufficient detail. From these and other inputs, we have structured a Naval Aviation Vision, identified goals, and developed plans to accomplish these goals. We have communicated these to all Naval Aviation communities and the Air Board (the senior members of Naval Aviation). This process developed an effective, integrated strategy for the future, and a vision for all of Naval Aviation. The Vision articulates where Naval Aviation is today, where we need to go to maintain our operational excellence, and how we will get there.

Challenges

As we began this process, we faced several key tasks. The first was to ensure that the Naval Aviation Vision and its strategic plans were aligned with higher-level strategy and policy. Our second key task has been the development of a *shared* vision, proba-

bly one of the most difficult elements in this process due to the operational and geographic diversity of Naval Aviation. Hence, we began with the commander's guidance, developed it at the Fleet conferences, solicited and incorporated Fleet feedback, and achieved Air Board concurrence.

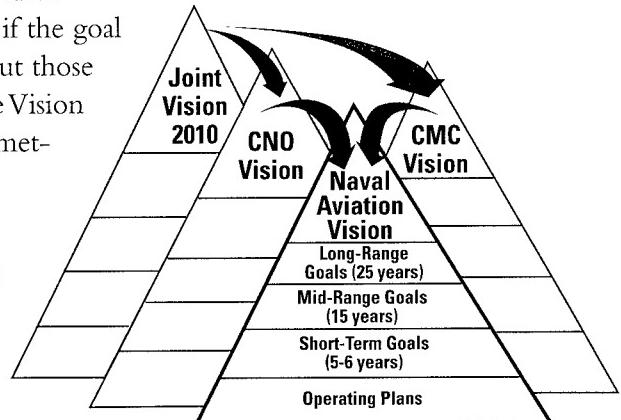
Following the development of our Strategic Vision, we identified its specific elements and goals which must be met to uphold the Vision. For long-term, or strategic goals, we selected only those whose accomplishment benefits Naval Aviation. "Gap" analyses were performed on all possible goals to assess where Naval Aviation is now, and to determine where it would be if the goal were achieved. This technique allowed us to screen out those goals that would result in only marginal advances. The Vision has incorporated a system of concrete objectives and metrics to measure our progress.

The next stage involves reconciling the Vision with the fiscal, political, and technological constraints that Naval Aviation faces in the coming years. This is done in the programming phase of the annual planning, programming, and budgeting cycle. Although the process may appear complicated, it is actually straightforward and incorporates the active participation of Fleet operators.

The last and most crucial factor has been, and will continue to be, the feedback process. At the close of each of our off-sites, each issue was reviewed by teams of subject matter experts. The revised material was sent to the off-site participants and to all Naval Aviation communities for review and comment — the results of those reviews are incorporated into this document. Future changes will be accomplished in a similar manner.

FROM CONCEPT TO REALITY

Requirements officers and program managers introduce outstanding issues in Naval Aviation during biannual Naval Aviation Liaison Group (NALG) conferences. The NALG is an open forum in which leaders within and outside of Naval Aviation (including type commander representatives) meet to develop consensus on issues. From the NALG an issue moves on, subject to continuing debate at many levels, taking on more definition. The Aviation Flag Board — consisting of the senior officers in the Air Warfare Division in the office of the Chief of Naval Operations — is the final arbiter within Naval Aviation. It is here that the issues are prioritized and phased to fit within fiscal and technological constraints. The Air Warfare Division then incorporates the issues into a sponsor program proposal which is presented to the Department of the Navy's leadership for approval. In this manner the Naval Aviation Vision is transformed into budget priorities and ultimately, hardware in the Fleet.

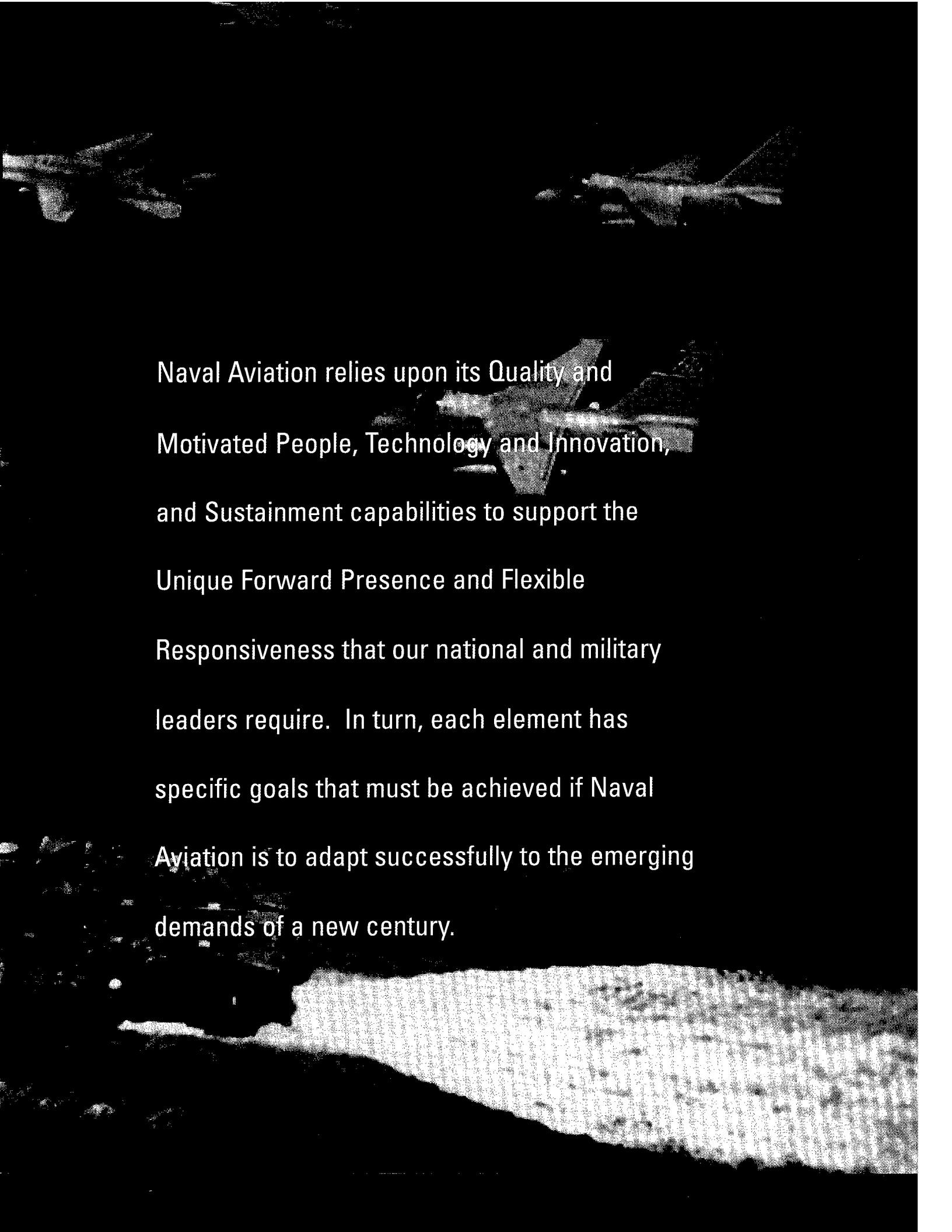


External Alignment of the Naval Aviation Vision

Section 1: Vision Element Definitions and Goals

Naval Aviation provides a robust and credible forward presence, one that is able to respond flexibly to crises and to project dominant power when called upon to do so. This section examines the five central elements of the Naval Aviation Vision — developed by the Fleet — that must underpin these capabilities.

Naval Aviation's Vision is built upon the concepts set forth in *Joint Vision 2010* and the *Naval Operational Concept*. With these as our foundation,



Naval Aviation relies upon its Quality and Motivated People, Technology and Innovation, and Sustainment capabilities to support the Unique Forward Presence and Flexible Responsiveness that our national and military leaders require. In turn, each element has specific goals that must be achieved if Naval Aviation is to adapt successfully to the emerging demands of a new century.

1. QUALITY AND MOTIVATED PEOPLE

Naval Aviation will comprise the nation's most talented and highly trained personnel. It will be motivated by strong leadership espousing the core values of the Department of the Navy — honor, courage and commitment.

Naval Aviation is dedicated to recruiting the best educated and most qualified young men and women to fill the enlisted and officer ranks. Naval Aviation personnel will be technically trained and fully capable of operating and maintaining the most sophisticated aviation weapons and support systems. Naval Aviation will maintain high retention rates through improved quality of life programs, including educational opportunities, monetary compensation, advancement, and leadership positions.

GOAL 1-1: RECRUITING

Recruit officers and enlisted personnel who meet high academic, physical, and character standards. These personnel will have specific aviation rating and warfare specialty designations requiring subsequent professional training and performance.

GOAL 1-2: TRAINING

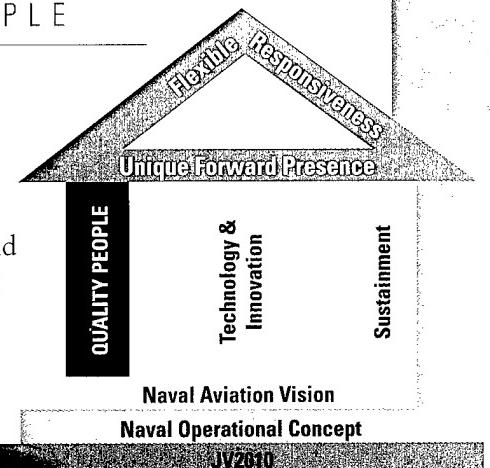
Ensure that training remains a top priority. Training will be properly resourced to maximize educational technology. "Total system" training for maintenance personnel and aircrews will be an integral part of weapon system acquisition and introduction and subsequent improvements.

GOAL 1-3: LEADERSHIP

Instill within the leadership corps those qualities that inspire loyalty, trust, and dedication. These qualities will become institutionalized, emphasized in training, and practiced at all levels within the chain of command.

GOAL 1-4: CAREER DEVELOPMENT AND RETENTION

Provide challenging and rewarding careers and retain qualified personnel. Naval Aviation will give people leadership challenges, advanced educational opportunities, and competitive monetary and benefits compensation.



2. TECHNOLOGY AND INNOVATION

Naval Aviation will aggressively pursue the application of advanced technology and innovative operational concepts, ensuring the deployment of an affordable, effective force in this era of unpredictable threats. It will:

- Build on proven, existing capabilities, and maintain an environment that supports innovation.
- Partner with industry to leverage the use of Commercial-Off-The-Shelf technology/ Non-Developmental Item (COTS/NDI) systems.
- Anticipate exploitation of our emerging technologies by our adversaries.
- Use technology as a force multiplier and as a means of reducing costs and improving the effectiveness of all Naval Aviation disciplines, including: Modeling and Simulation (M&S), Information Management, and Life Cycle Management.

GOAL 2-1: TECHNOLOGY EXPLORATION

Pursue a robust Science & Technology (S&T) program supporting near- and long-term Naval Aviation requirements.

GOAL 2-2: TECHNOLOGY TRANSITION OPPORTUNITY

Identify transition opportunities to rapidly move new technology into deployable systems for both manned and unmanned platforms.

GOAL 2-3: INVESTMENT PRIORITIES

Ensure development priorities and supporting technology insertion roadmaps reflect "true" warfighting requirements.

GOAL 2-4: INDUSTRY PARTNERSHIP

Effectively couple world-class commercial technology to Naval Aviation acquisition programs.

GOAL 2-5: AFFORDABLE TECHNOLOGY

Apply technology to reduce life-cycle ownership costs of Naval Aviation systems.

GOAL 2-6: IMPLEMENTATION/TRANSITION TECHNOLOGY

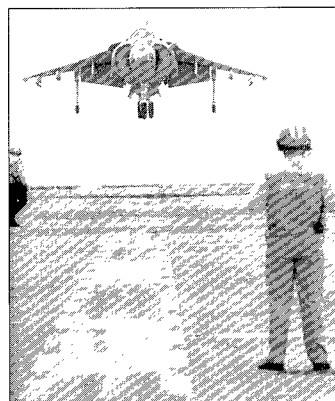
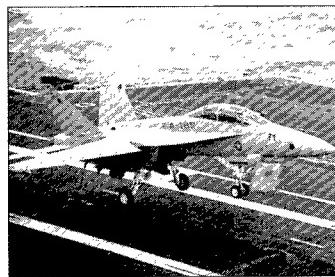
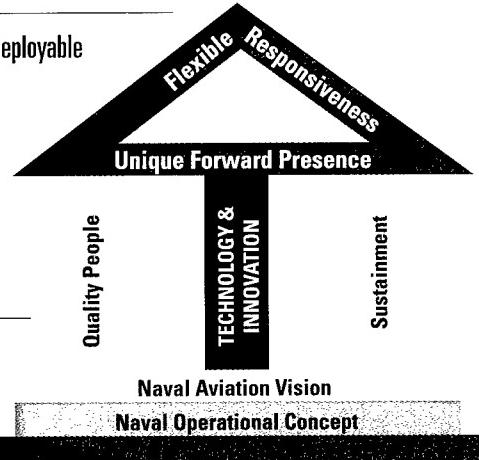
Ensure training and support systems are in place to accommodate new technology's Initial Operational Capability (IOC).

GOAL 2-7: FOSTER AND REWARD TECHNOLOGY INNOVATION

Foster an environment that encourages creativity and rewards innovation.

GOAL 2-8: TECHNOLOGY EXPLOITATION

Minimize the effects of reverse technology exploitation by our adversaries.



3. SUSTAINMENT

Naval Aviation is supported by cost-effective, focused logistics that ensure a rapid, scaleable response across all mission areas. Naval Aviation will achieve and maintain superior sustainment by:

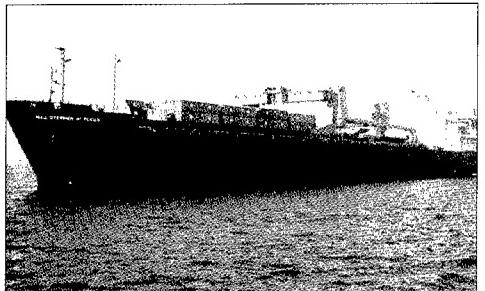
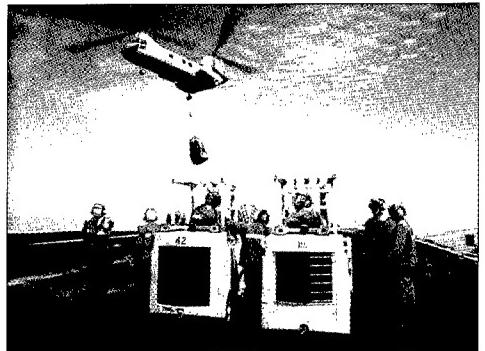
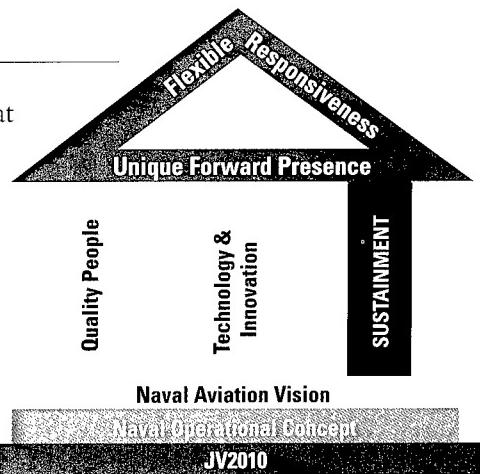
- Aggressively influencing the acquisition process to achieve maximum weapon system reliability and maintainability.
- Capitalizing on state-of-the-art logistics information technology.
- Decreasing its forward-deployed logistical footprint.
- Skillfully managing integrated logistics support resources for optimum performance.
- Institutionalizing the concept of focused logistics throughout the support community.

GOAL 3-1: HIGH TECHNOLOGY JOINT LOGISTICS

Actively leverage U.S. and international commercial support technologies to achieve a highly focused, "just-in-time" system of logistics that is fully compatible in the joint environment and achieves the highest levels of operational readiness at the lowest possible life-cycle cost.

GOAL 3-2: SYSTEM DESIGN RELIABILITY IMPROVEMENTS

Demand superior weapon system reliability and maintainability as design objectives on all new and modified weapon systems. The reliability of all fielded weapons will be continuously monitored. Maintenance plans and processes will be updated, as needed, to ensure that inherent hardware design reliability is maintained in the field.



GOAL 3-3: SUPPLY TRANSPORTATION

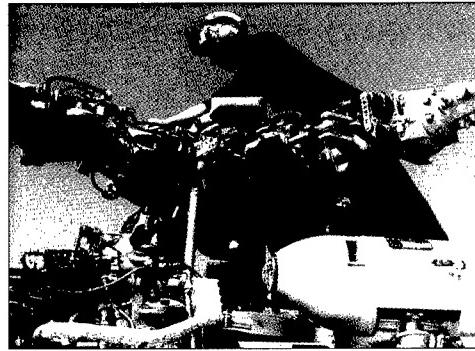
Ensure that materiel delivery systems of the future are highly efficient and effective, fully integrated in the carrier battle group/amphibious ready group and joint service environment, and possess sufficient speed, capacity, and reach to support the most demanding operational scenario.

GOAL 3-4: MANAGEMENT METRICS

Develop and implement a system that measures aviation support costs at all levels. The system will provide the management information needed to make targeted spending adjustments, resulting in the maximum readiness of forward-deployed forces at minimum cost. Seek continual process improvement at all levels of aviation maintenance and repair.

GOAL 3-5: MANPOWER AND TRAINING

Optimize the effectiveness of support personnel by fully capitalizing upon technical advances in diagnostic tools, training, and repair processes. Valuable technician knowledge and experience will be carefully protected through commitment to quality training and innovative personnel management.



GOAL 3-6: SURGE/MOBILIZATION

Work in full partnership with industry to preserve a commercial industrial base that has a robust "just-in-time" capability, has the capacity to meet contingency surge mobilization requirements, and retains its long-term technical viability.

GOAL 3-7: COMMERCIAL SOURCING

Ensure that, when Commercial Off-The-Shelf technology is employed in aircraft and weapon systems, effective, economical, and fully responsive life-cycle support is also provided.

GOAL 3-8: COMMON HARDWARE CONFIGURATION

Fully exploit the areas of weapon system and repairable component commonality in order to reduce the total forward-deployed, joint service logistical footprint.

4. UNIQUE FORWARD PRESENCE

Naval forces, unencumbered by the dictates of host nations and the politics of gaining access ashore, will continue to provide responsive independent strike, precision, depth-of-influence, and maneuver capabilities. This timely and sustainable sea-based presence provides ready, visible, and scaleable response to uncertain humanitarian, political, and military crises.

GOAL 4-1: ENHANCED FORWARD PRESENCE

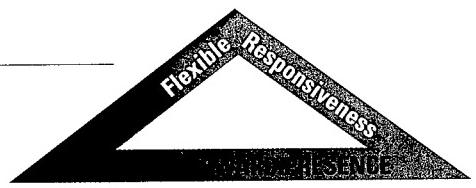
Recognizing changing geopolitical and economic priorities Naval Aviation will enhance its worldwide forward presence through multinational exercises, port visits, foreign military training and representation on allied staffs. These activities, plus the active efforts of personnel assigned to overseas naval air installations, are meant to provide timely and sustainable on-scene protection of U.S. national interests, and foster closer relationships with our friends and allies.

GOAL 4-2: SUPPORT

Achieve a level of support abroad and throughout the nation, Congress, Department of Defense, and other federal agencies that ensures viable, efficient, and affordable forward presence.

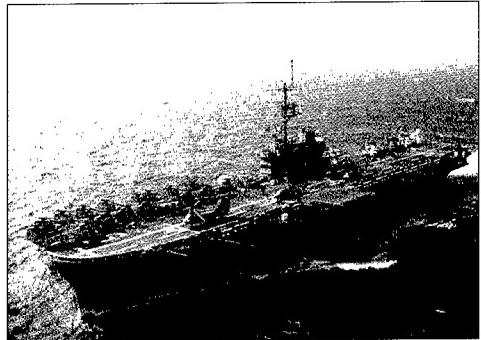
GOAL 4-3: RESOURCES

Define and provide sufficient resources to support and sustain forward presence in all areas dictated by our national interests.



Naval Aviation Vision

Naval Operational Concept
JV2010

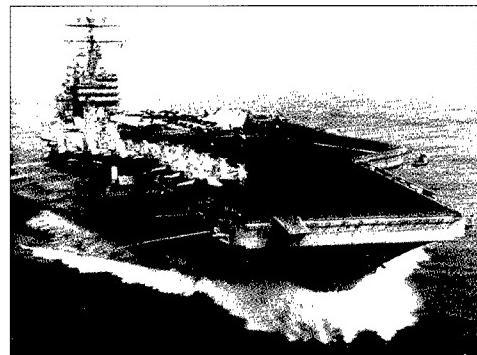


5. FLEXIBLE RESPONSIVENESS

Naval Aviation will provide the National Command Authority with a range of capable, credible, and scaleable options ranging from non-lethal deterrence to rapid, precise, and decisive engagement. Expeditionary in nature, Naval Aviation provides a wide spectrum of unique capabilities able to adapt to changing geopolitical realities.

GOAL 5-1: DOCTRINE / TRAINING

Provide the doctrine and training necessary to successfully respond to National Command Authority tasking across the complete spectrum of conflict.



GOAL 5-2: COMMAND, CONTROL, COMMUNICATION, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (C⁴/ISR)

Provide the situational/battlespace awareness and command-and-control systems, using joint, open, and flexible architecture to enable efficient and effective employment of resources.



GOAL 5-3: MOBILITY

Enhance mobility to enable the rapid concentration of forces and fires in keeping with the strategic concept of *Forward... From the Sea*.



GOAL 5-4: MUNITIONS

Provide munitions and weapon systems that will enable naval forces to respond across the full spectrum of conflict.

GOAL 5-5: JOINT

Ensure our core competencies are developed and maintained to be able to respond to the National Command Authority's tasking.

GOAL 5-6: BATTLESPACE DOMINANCE

Ensure a balanced investment in the Navy-unique warfighting capabilities needed to achieve battlespace dominance at sea and in the littoral.



Quality People

Technology &
Innovation

Sustainment

Naval Aviation Vision

Naval Operational Concept

Section 2: Program Plans, Descriptions, and Roadmaps

The previous section presented the Vision elements and goals. This section deals with the “tools” Naval Aviation will use to make the Vision a reality and achieve its goals — the programs that will put aircraft in the air, ordnance on target, and forces on station.

These are the means by which Naval Aviation,

and by extension the Navy-Marine Corps team,
are able to meet the challenges and objectives
articulated by the National Military Strategy and
our national leaders.

SYSTEM OVERVIEW

Naval Aviation has long been at the forefront of U.S. power-projection capabilities. As a carrier and its air wing or an amphibious ready group deploy, they represent a unique forward presence that provides a broad spectrum of warfighting capabilities. By leveraging technology, innovative tactics, and highly trained people, these forces provide the National Command Authority with a wide range of crisis-management and combat capabilities.

As Naval Aviation moves into the 21st century, we will continue to use a systems approach to improve its capabilities. The foundation of this methodology is making proper use of Naval Aviation's most important asset — its people. Our aircrews are able to perform a broad spectrum of missions, and our support personnel are the bedrock of the entire Naval Aviation organization. Naval Aviation must continue to emphasize consistency, education, and leadership in its manpower policies in order to sustain its standard of excellence and the morale of its people. This leadership challenge also includes fostering an understanding of modern warfare and applying naval operational concepts across a range of scenarios.

The systems approach also entails a balance of affordable, multimission platforms, systems, and weapons. New aircraft and technology will provide Naval Aviation with greater lethality, increased reliability, and enhanced survivability. Reducing the number of aircraft types and transitioning from single-mission to multimission platforms will provide Naval Aviation with greater mission flexibility and cost-effective maintenance, as well as a flexible logistics support base.



Finally, balance means pursuing the right mix of low observability, countermeasures, threat avoidance, tactics, and standoff weapons. There is no one technology or attribute that can meet all mission requirements. Taking a balanced approach will allow Naval Aviation to fulfill its mission requirements even when one element has a diminished effectiveness due to an enemy's capabilities.

All told, this systems approach to improvement will ensure that Naval Aviation continues to respond rapidly, credibly, and flexibly to future contingencies.

S A F E T Y

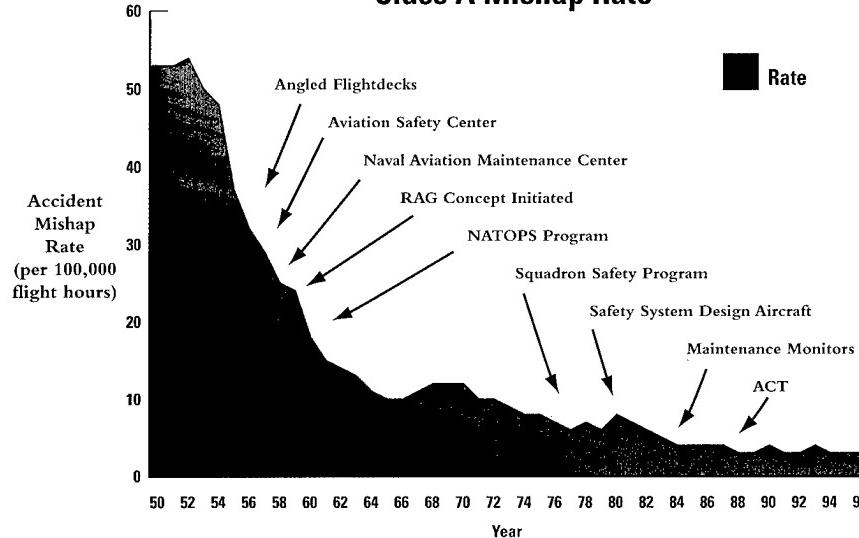
Balance is also achieved by a consistent emphasis on safety. We have made impressive progress in aviation safety since the 1950s, but in the last few years we have reached a plateau. The incalculable cost of the loss of a shipmate and the staggering cost of the destruction of hardware demand a fresh approach to reducing the mishap rate. Ultimately, our goal is to continue to drive mishap rates toward zero while preserving, or even enhancing, our warfighting readiness.

The tenets of our safety policy include:

- New and remanufactured aircraft shall be equipped with Flight Data Recorders (FDRs), Cockpit Voice Recorders, Condition-Monitoring Systems, Ground Proximity Warning Systems, and Collision Avoidance Systems.
- Passenger aircraft (including rotary-wing and troop-carrying aircraft) and large aircraft shall be refitted with commercial-standard systems for comparable aircraft.
- All other aircraft shall be equipped with subject systems when justified by cost-benefit analysis.

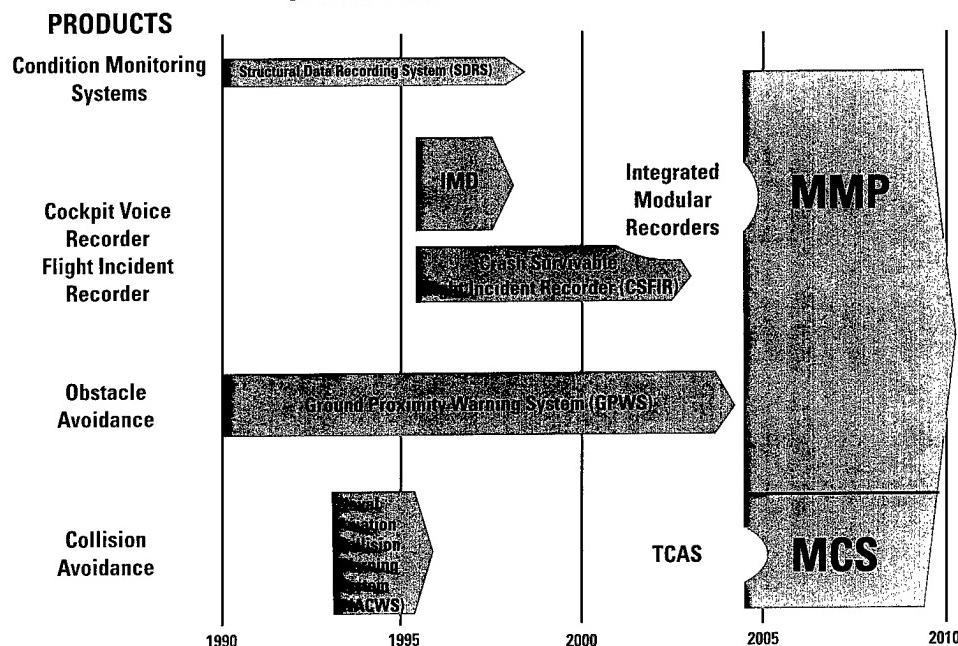
There are several systems that will allow us to improve Naval Aviation safety.

Naval Aviation Success Story Class A Mishap Rate



- Condition-monitoring systems are a recent introduction of common industrial vibration-monitoring techniques and equipment into aviation. Integrated Mechanical Diagnostics (IMD) provides significant, early information about anomalies in the drive train (including the engines) and monitors rotor systems for tracking and balancing. IMD is a safety-of-flight system because of its ability to predict a failure before it occurs.
- Based on the past 10 years of statistics, controlled flight into terrain, including water, has been a primary cause of fatal mishaps. The introduction of the Ground Proximity Warning System into many naval aircraft, especially tactical aircraft and helicopters, is predicted to have a payback of 50 percent or higher in the first year.
- Flight Data Recorders are windows on human performance — they monitor more than 80 percent of potential accident-causing factors. “Glass cockpits” have presented new challenges to aircraft crash investigators by reducing the amount of hard evidence that can be found at a crash site. FDRs are needed to provide information that cannot be provided any other way.
- The number of near mid-air collisions involving naval aircraft has increased significantly during the past few years. Collision avoidance systems are critical safety-of-flight systems that allow aircraft to “see” aircraft around them and maintain their separation.

ROADMAP FOR SAFETY RELATED PRODUCTS



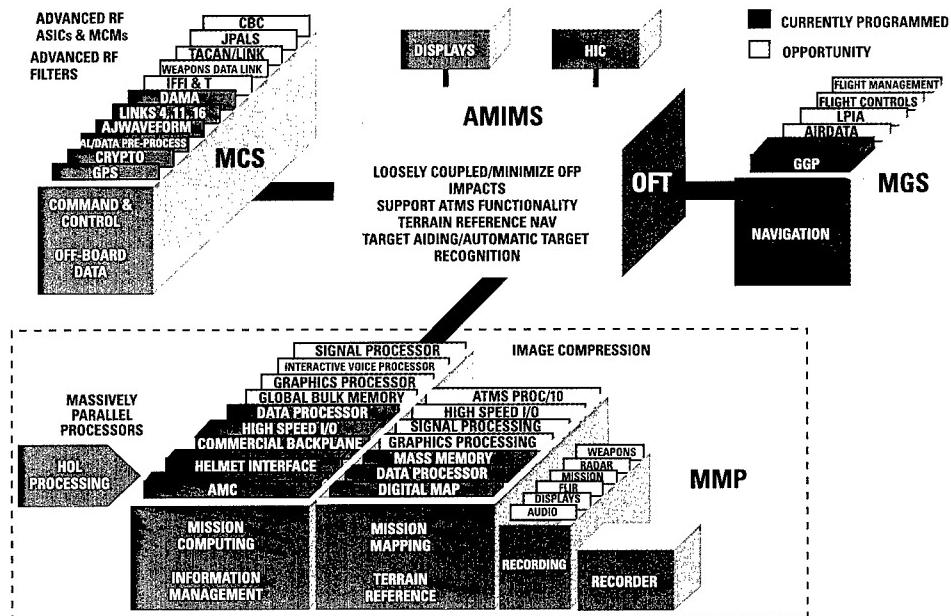
AFFORDABLE AVIONICS

The current fiscal situation also demands that the service life of existing weapon systems be extended and that — to the maximum extent possible — we pursue common solutions to common operational requirements. Consequently, our avionics systems must be lighter, smaller, less complex, and possess greater functionality. We must field dual-use systems that can adapt to emerging communication, navigational, safety and computing concepts, and that promote safe and efficient flight in Department of Defense, U.S. civil, and European airspace.

We have responded to the austere funding environment by pioneering “win-win” partnerships between Naval Aviation and industry for updated, affordable, and jointly-interoperable mission avionics. Ongoing acquisition reform efforts have provided the opportunity to get the most out of our existing funding, enabling us to achieve significant incremental decreases in unit cost and increases in system reliability and readiness. Pre-planned digital technology insertion for next-generation systems and the implementation of a commercial maintenance concept virtually eliminates obsolescence issues. Acquisition savings and the program manager’s ability to leverage industry products and independent R&D investments provides Naval Aviation with a rapid and cost-effective means to achieve increased avionics functionality.

Performance-based avionics requirements may allow us to share systems with the Army, Air Force, Coast Guard, and commercial users. Future avionics components used by Naval Aviation may also be used in other airborne, surface, and ground-vehicle applications, a development that will benefit the entire Department of Defense.

The System of Systems for Tomorrow



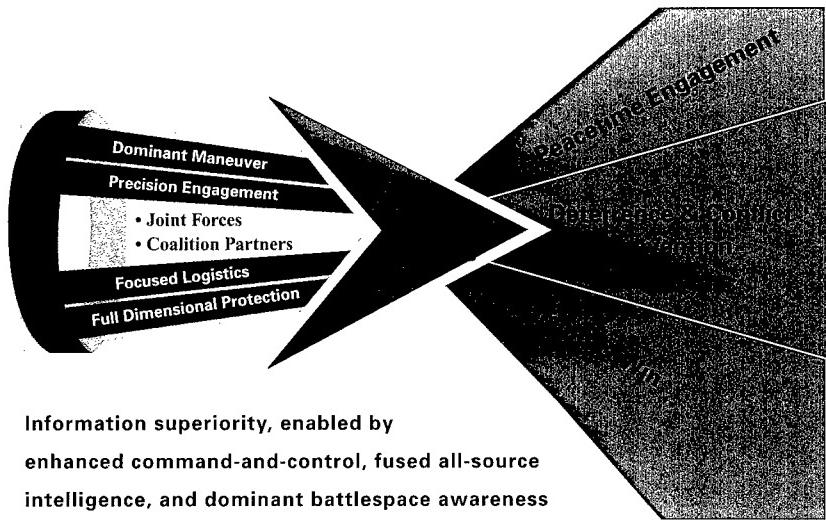
Our vision of air combat electronics in the next century includes a systems approach that integrates modular hardware products — including the Modular Communications System (MCS), the Modular Guidance/Navigation System (MGS), and the Modular Mission Processor (MMP) — under the Advanced Mission Information Management System (AMIMS). This “System of Systems for Tomorrow” has significant growth potential. It will accommodate advances in networking, broadcast intelligence, enhanced situational imagery, mission replanning, targeting, and threat avoidance.

C⁴/ISR

Naval Aviation has entered the Information Age, where the speed and thoroughness in which accurate information is collected, analyzed, disseminated, and protected are of paramount importance. *Joint Vision 2010* states that information superiority is achieved by effective command, control, communications, and computer (C⁴) links and the fusion of intelligence, surveillance, and reconnaissance (ISR) information, which in turn can lead to dominant battlespace awareness.

With its current and planned systems, Naval Aviation provides a command-and-control and sensor architecture to shape joint operations, as well as the airborne platforms to support them. The capability to provide direct links to the Joint Force Commander at sea from airborne reconnaissance platforms provides real-time ELINT, SIGINT, and high resolution SAR/MTI and optical tracking from long-range, long endurance P-3s, detailed tactical reconnaissance of the battlefield from F-14s and F-18s, and an explicit electronic order of battle from ES-3s, EP-3s, and EA-6Bs. Aircraft sensors and communications systems extend the field of view for the Joint Force Commander hundreds of miles beyond the horizon while providing direct connectivity to both the Joint Force Air Component Commander and the MAGTF ashore. Two examples of key elements embedded in our current C⁴/ISR system include the Cooperative Engagement Capability (CEC) and Link 16/Joint Tactical Information Distribution System (JTIDS). CEC significantly improves battle force anti-air warfare capability by integrating the sensor data of multiple ships and aircraft into a single, real-time, fire-control quality composite track picture. Operating under the direction of a designated commander, CEC will enable a battle group or Joint Task Force to act as a single defensive combat system. Link 16/JTIDS is a high-capacity, digital information distribution system that provides rapid, secure, and jam-resistant communications, navigation and identification capabilities for naval tactical aircraft.

Advanced technologies also allow Naval Aviation to monitor and protect the world’s critical sea lines of communication. The Navy maintains a worldwide Maritime Command/Surveillance Tactical Support Center (TSC) network. TSCs serve as nodes in the Joint Maritime Command Information System (JMCIS), an integrated C⁴I system that provides commanders afloat and on shore with a comprehensive pic-

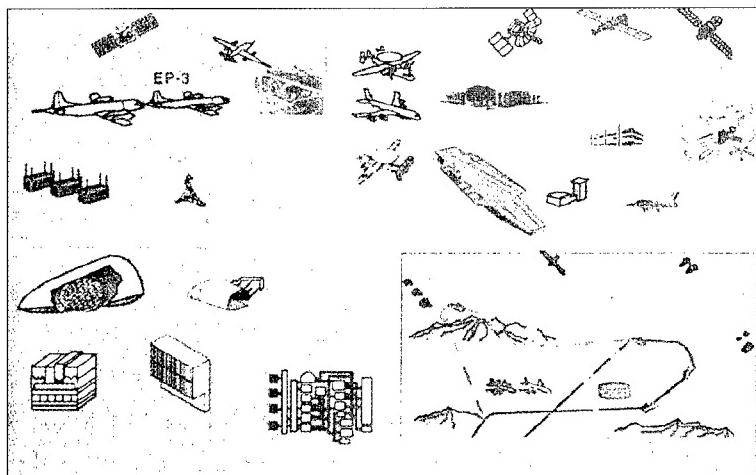


Information superiority, enabled by enhanced command-and-control, fused all-source intelligence, and dominant battlespace awareness will provide improved targeting information directly to the most effective weapon system.

ture of friendly, hostile, and neutral forces on land, at sea, or in the air. The TSCs are supplemented by Mobile Operations Command Centers; ground communication and control stations that can be quickly transported by P-3C Orion aircraft to remote locations.

In the area of preflight mission planning, Naval Aviation is relying increasingly upon systems such as the Tactical Automated Mission Planning System (TAMPS). TAMPS allows tactical data to be loaded quickly and efficiently into aircraft computers and software, improving the overall ability of our aircrews to employ their aircraft and weapons. It also includes broader, force level decision-support features, and it is compatible with JMCIS and other joint systems.

Naval Aviation's leveraging of information will continue to expand in the future. Ultimately, its C⁴/ISR architecture must have the ability to support airborne strike packages and other airborne assets with real-time intelligence, fused together from a wide array of sources and systems. It also will have the ability to send this imagery, video, and other information to strike and support aircraft via data link.



AIRCRAFT CARRIERS



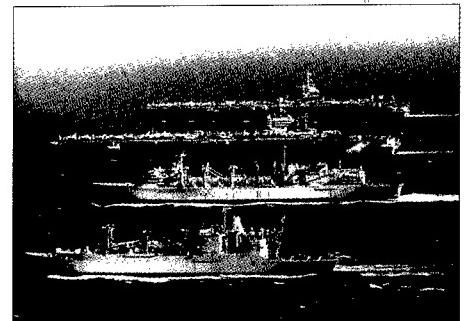
A carrier battle group provides the National Command Authority and warfighting Commanders-in-Chief with a flexible force to respond to a wide variety of international challenges. An aircraft carrier represents four and one-half acres of sovereign — and mobile — American territory that can project U.S. power wherever it might be required. Maintaining the carrier force requires a carefully crafted plan that combines new construction with the preservation of existing carrier assets.

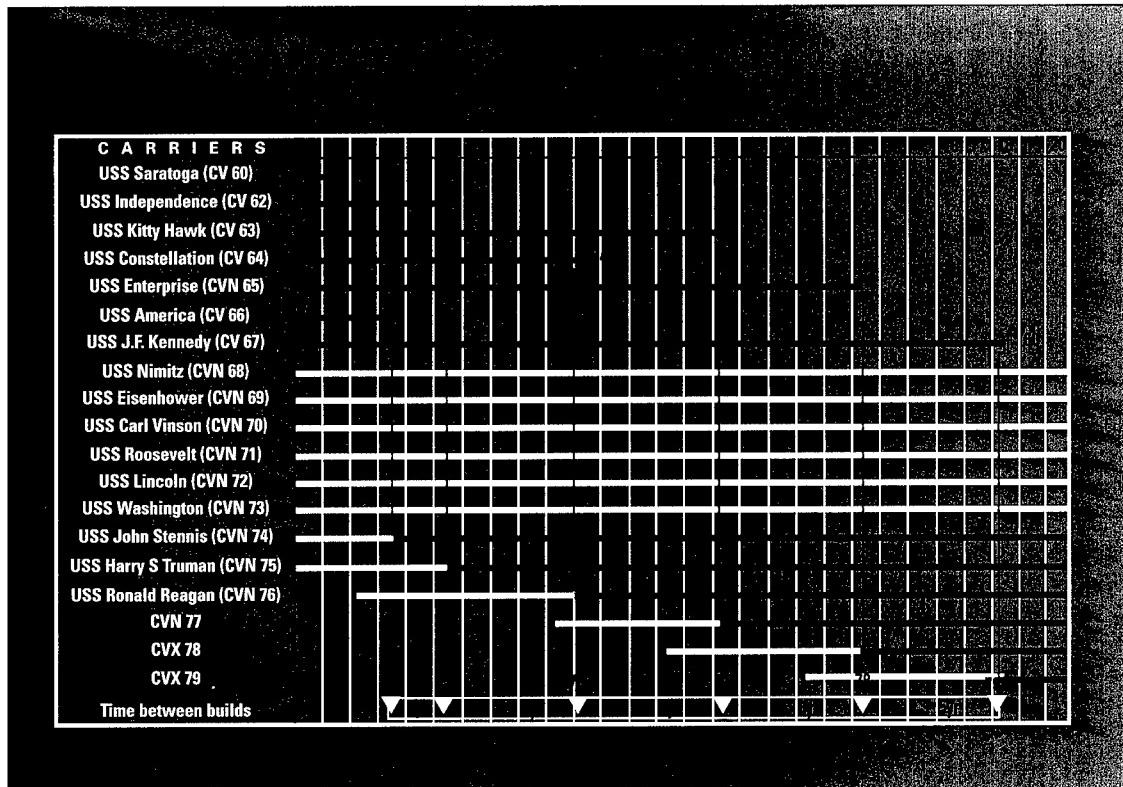
THE AIRCRAFT CARRIER PLAN: A DUAL-TRACK STRATEGY

To support a continuous forward presence in the “strategic hubs” of the Mediterranean Sea, Indian Ocean, and western Pacific Ocean would require 15 aircraft carriers. Presently, a force of 12 aircraft carriers (11 active and one operational reserve) meets this requirement at an acceptable level of risk. The current carrier replacement plan, depicted in the accompanying chart, shows how the Navy will preserve and modernize its carrier force in the future.

A comprehensive plan to modernize our aircraft carrier force for the next century is based on a dual-track strategy. This strategy includes the modernization of existing carriers and the addition of new ships to the force, creating a phased replacement plan that maintains essential capabilities and force structure. The “near-term” element of the dual-track strategy is the procurement of the tenth and final *Nimitz*-class carrier, CVN 77, in FY 2002. Scheduled for commissioning in 2008, CVN 77 will replace the conventionally powered *USS Kitty Hawk* (CV 63) after 47 years of service. CVN 77 will be a “smart” transition ship, incorporating new technologies resulting from research and development efforts that are currently underway.

The second element of the dual-track strategy is the design of an entirely new class of aircraft carriers, now referred to as CVX. CVX is being designed on a “clean sheet of paper,” but will retain the core capabilities resident in our carriers today. CVX will feature improved characteristics in selected areas, such as launch and recovery equipment, flight deck layout, C⁴I systems, information networks and propulsion systems. These ships also will incorporate features that will make them more affordable to operate. The lead CVX will be procured in FY 2006, and will enter service in FY 2013.



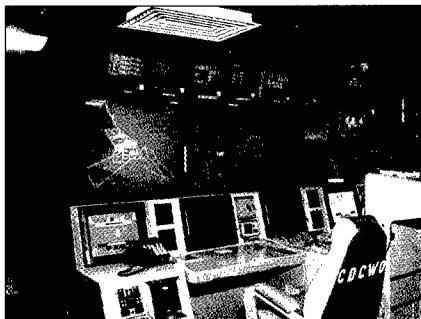
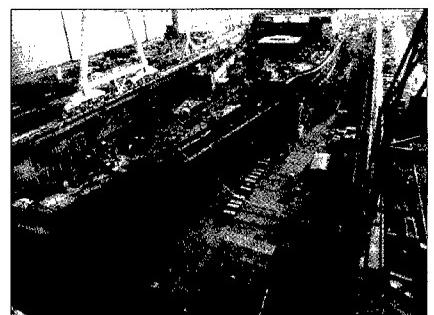


CARRIER MODIFICATIONS AND IMPROVEMENTS

Major improvements and equipment upgrades to existing ships' systems will continue to keep our current carrier force ready to meet the challenges of the future. We are also revamping our maintenance plans, decreasing the number of long-term shipyard maintenance periods our carriers must undergo.

Nimitz-class carriers are transitioning from the Engineering Operating Cycle (EOC) to the Incremental Maintenance Plan

(IMP). The IMP supports the demanding carrier operation schedule, and also contributes to steadier, less volatile workloads at both public and private shipyards. These new shipyard periods — called Planned Incremental Availabilities (PIA) and Docking Planned Incremental Availabilities (DPIA) — should last approximately six months and 10 months, respectively. Longer availabilities will still be required for some maintenance evolutions. In 1998, for instance, USS *Nimitz* (CVN 68) will commence a three-year Refueling Complex Overhaul (RCOH) at Newport News



Shipbuilding. The later ships of the class will also be refueled and overhauled at regular intervals following the completion of *Nimitz*'s RCOH.

Carrier upgrades and modifications continue to increase the operational effectiveness, technical efficiency, and maintainability of our carrier force. In the area of command and control, USS *Dwight D. Eisenhower* (CVN 69) recently received the CEC system in conjunction with the Advanced Combat Direction System Block 1.

Permanent Extremely High Frequency (EHF), Super High Frequency (SHF) including Commercial "C" Band Challenge Athena III, and upgraded Ultra High Frequency (UHF) satellite communication suites provide vastly improved access to information databases worldwide. Link 16/JTIDS, being installed in all carriers, provides a new dimension in tactical information exchange. Numerous processing and display system upgrades will ensure that our joint planners, decision makers, and warfighters in carriers have near real-time access to the latest data available.

Radar upgrades continue to increase the reliability of current systems and improve their maintainability and performance in littoral operating areas. Plans are in place to upgrade the aircraft carrier's self-defense weapons mix. AN/SPS-48E radars were recently installed on USS *Abraham Lincoln* (CVN 72) and USS *George Washington* (CVN 73). The AN/SPQ-9B horizon-search radar will replace the currently installed Target Acquisition System. The Evolved Sea Sparrow Missile will be the successor to the RIM-7P Sea Sparrow ship self-defense missile system.

In the area of aircraft launch and recovery systems, the Improved Carrier Optical Landing System, which includes the Improved Fresnel Lens Optical Landing System and the Long-Range Line-up System will provide optical displays so that the pilot can make early corrective actions to prevent landing accidents and improve aircraft boarding rates.

Other upgrades of carrier systems are more prosaic, but are also critical to the performance of carriers and their crews. For instance, during a recent complex overhaul, *Eisenhower* received an additional air conditioning plant as well as upgrades to the chilled water distributive system. These same modifications have also been performed in *Lincoln*, and are scheduled for USS *Carl Vinson* (CVN 70) and USS *Enterprise* (CVN 65) during their next availabilities.

Aircraft carriers are also being modified to make them more environmentally "friendly." As part of our Pollution Control Program, R12 refrigerant conversions began in FY 1996 on *Lincoln*; this upgrade will be incorporated on all carriers by the year 2000. R114 refrigerant conversions will take place from FY 2000 through FY 2005. Planning is also underway for the installation of oily water separators and plastic waste processors in all carriers.

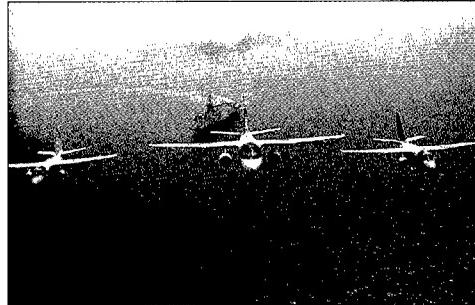
These upgrades, and the construction of new ships incorporating emerging technologies and concepts, will ensure that the United States maintains a combat-ready carrier force, one that can spearhead the Navy's forward-presence, crisis-response, and warfighting efforts well into the 21st century.

CARRIER AIR WINGS

The reshaping of our Navy's force structure has had a significant impact on the number, focus, size, and capabilities of our carrier air wings (CVWs). The current force of ten active carrier air wings and one reserve air wing is based on the Department of Defense Bottom-Up Review of 1993. To afford this number of air wings, and to equip them with modernized aircraft, the Navy has restructured their composition. Force reductions, service life extensions, and judicious procurement combined with a reduction in the number of aircraft on each carrier have resulted in carrier air wings comprising 50 high-performance, multimission capable strike-fighter aircraft. Retirement of the venerable A-6E Intruder and the transition to a mix of F/A-18 Hornets and F-14 Tomcats is essentially complete, although two air wings will operate with an additional F-14 squadron as an F/A-18 placeholder until the Fleet introduction of the F/A-18E in 2001. Also, under the terms of the Department of the Navy's Memorandum of Agreement on TACAIR Integration, as many as four Marine Corps F/A-18 squadrons will deploy with Navy carrier air wings.

The carrier air wing's multimission capability is considerable in terms of flexibility, effectiveness, and sustainability. The tactical support provided by the electronic warfare capabilities of the EA-6B Prowler, the multi-purpose, multi-sensor capabilities of the E-2C Hawkeye, and the expanded surveillance and reconnaissance role of the S-3B Viking and ES-3A Shadow aircraft make the air wing the most capable power projection team ever assembled. The C-2A Greyhound provides carrier onboard deliveries necessary to sustain the air wing and other battle group assets. Completing the air wing mix are the SH-60F and HH-60 Seahawk helicopters, which provide multimission close-in support and Combat Search and Rescue (CSAR).

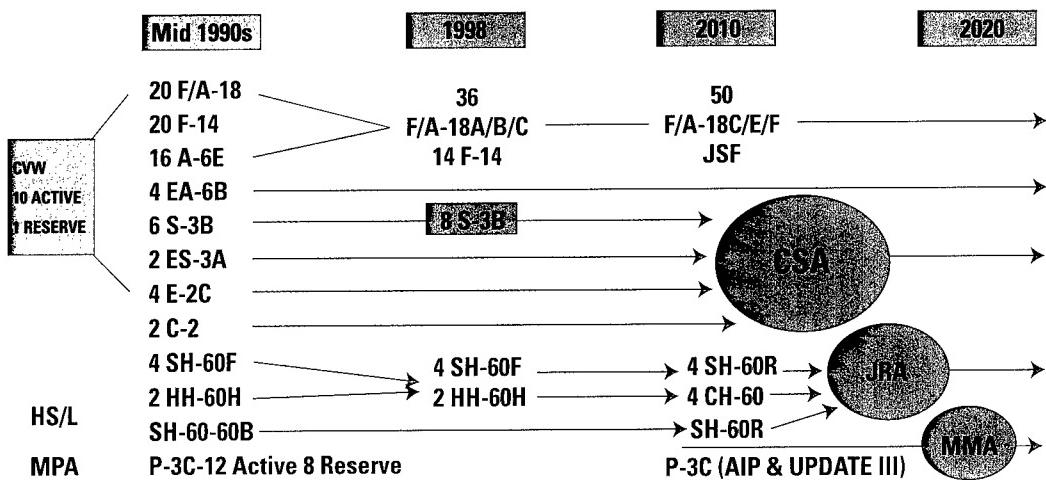
The accompanying charts depict the numbers and types of aircraft that will comprise our carrier air wings in the coming decades.



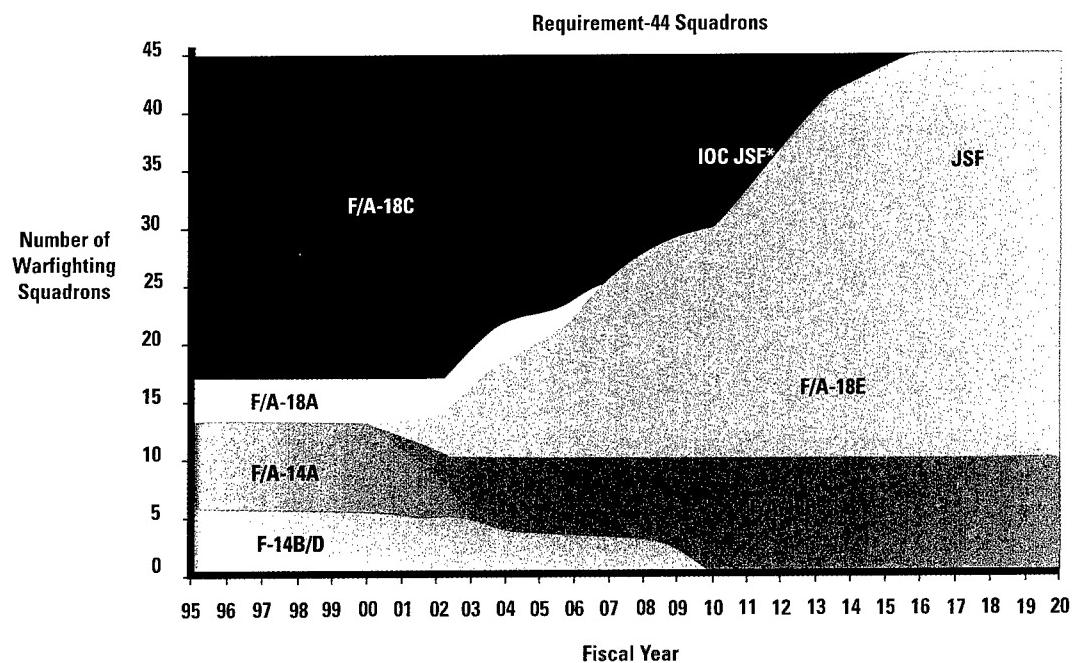
CVW AIRCRAFT MIX

F-14	14
F/A-18	36
EA-6B	4
E-2C	4
S-3	8
ES-3	2
SH/HH-60	6
C-2	2

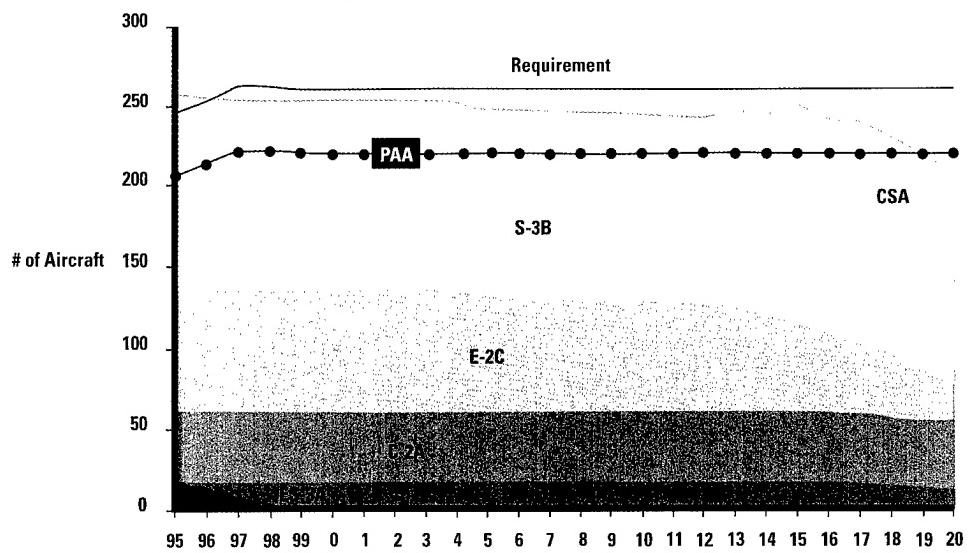
NAVY AIRCRAFT TRANSITIONS



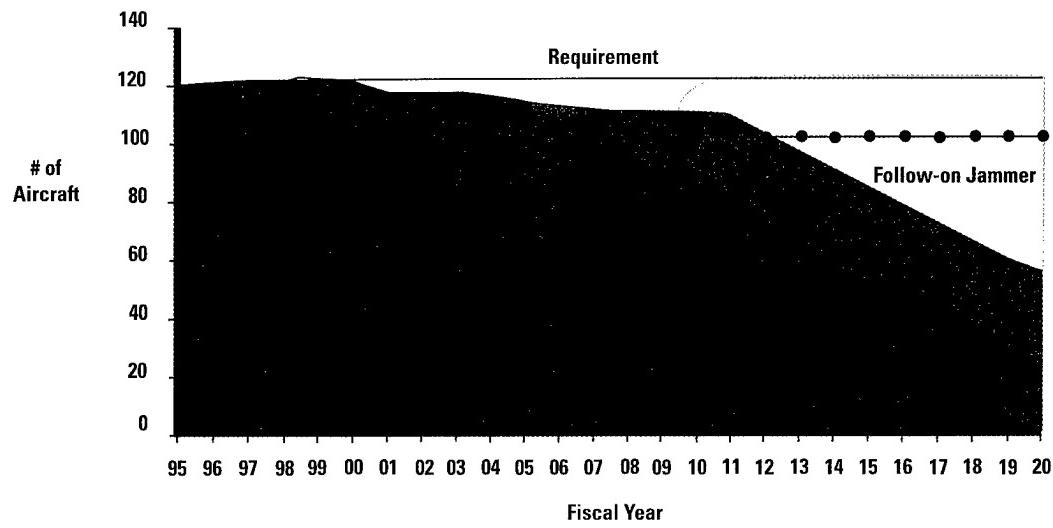
CVW TACAIR SQUADRON MIX



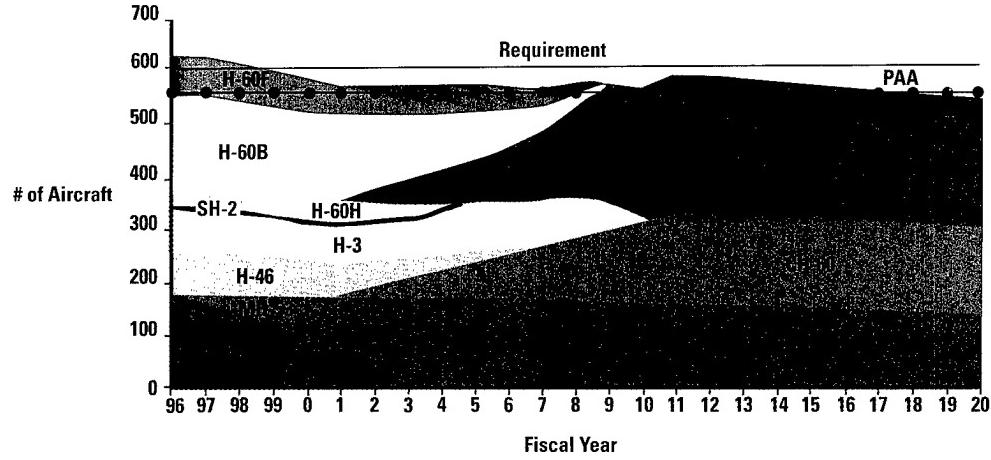
COMMON SUPPORT AIRCRAFT



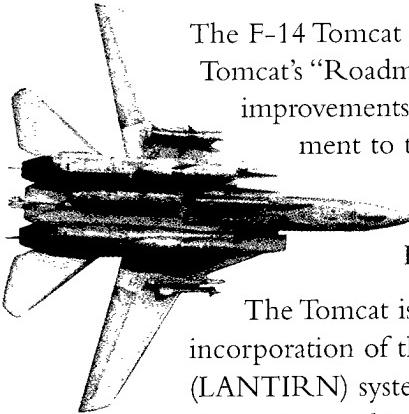
EA-6B INVENTORY VS. REQUIREMENT



HELO MASTER PLAN



F - 14 TOMCAT



The F-14 Tomcat continues to be the Navy's premier long-range fighter. The Tomcat's "Roadmap for the Future"—a plan to incorporate significant performance improvements over the next four years—makes the Tomcat a superb complement to the Navy's current F/A-18 Hornet aircraft. The F-14 will enable the Navy to maintain the desired force structure of 50 strike-fighter aircraft on each carrier deck until it is replaced by the F/A-18F Super Hornet.

The Tomcat is being configured as a potent precision strike-fighter with the incorporation of the Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) system. With LANTIRN, the Tomcat has an accurate, autonomous designation and targeting capability for the delivery of laser-guided bombs. This system is effective during day or night, and at high altitudes. The first LANTIRN-equipped Tomcat squadron, VF-103, deployed in June 1996 on board *Enterprise* (CVN 65), and all deploying battle groups will now have LANTIRN-capable Tomcats.

In addition to its precision strike capability, the F-14 is being outfitted with enhanced defensive countermeasure systems (BOL chaff and AN/ALR-67 Radar Warning Receiver), night vision capability, and Global Positioning System (GPS). These systems will significantly enhance the capability of the Tomcat in the strike-fighter role.

The F-14 carrying the Tactical Airborne Reconnaissance Pod System (TARPS) will continue to provide a manned tactical reconnaissance capability. The F-14's "Roadmap for the Future" includes the incorporation of a digital imaging and data link capability in 24 TARPS pods to provide battle group, joint force, and allied commanders with near real-time imagery for the detection and identification of tactical targets, and immediate threat and bomb damage assessment. This unique capability deployed with VF-32 on *Theodore Roosevelt* (CVN 71) in November 1996.



The "Roadmap for the Future" also includes a major aircraft safety improvement with the incorporation of a Digital Flight Control System. This system will prevent departure from controlled flight, and will improve F-14 flying qualities during shipboard recovery. Installation will begin in June 1998.

Another innovation in the F-14 community will be the combination of F-14B Upgrade and F-14D aircraft into single "Super" Tomcat squadrons starting in 1999. The major benefit of this plan will be to combine the unique attributes of the F-14D (such as the Advanced Self-Protection Jammer, JTIDS, the AN/APG-71 radar, and the Infrared

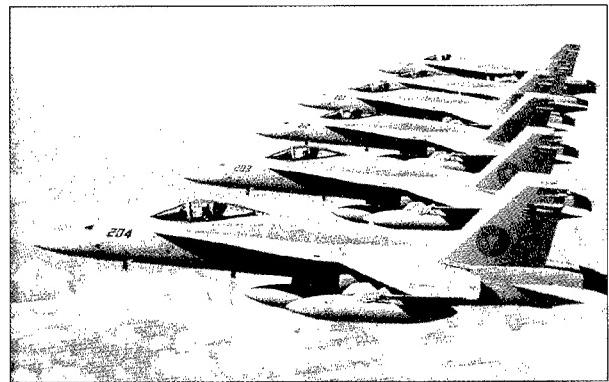
Search and Track System), with those of F-14B Upgrade aircraft. This F-14B/D squadron mix will be implemented in five carrier air wings.

The F-14's critical role in maintaining air superiority, and its ability to launch precision guided munitions, will ensure that the aircraft remains a vital player in the Navy's inventory until its retirement.

F / A - 1 8 H O R N E T

The F/A-18 Hornet is Naval Aviation's principal strike-fighter. This state-of-the-art, multimission aircraft serves in both the Navy and Marine Corps. Its reliability and safety records, high performance, and multiple weapons delivery capability have highlighted the Hornet's success as it surpassed 3,000,000 flight hours in December 1996.

Programmed improvements to the original Hornet A/B/C/D variants provide significant warfighting enhancements in the near term, including GPS, Link 16, AIM-9X Sidewinder/Helmet Mounted Cueing System, Combined Interrogator Transponder, Joint Direct Attack Munition/Joint Stand-Off Weapon delivery capability, and a Digital Communication System for close air support. The aircraft's weapons, communications, navigation, and Defensive Electronic Countermeasures systems will also continue to be upgraded.

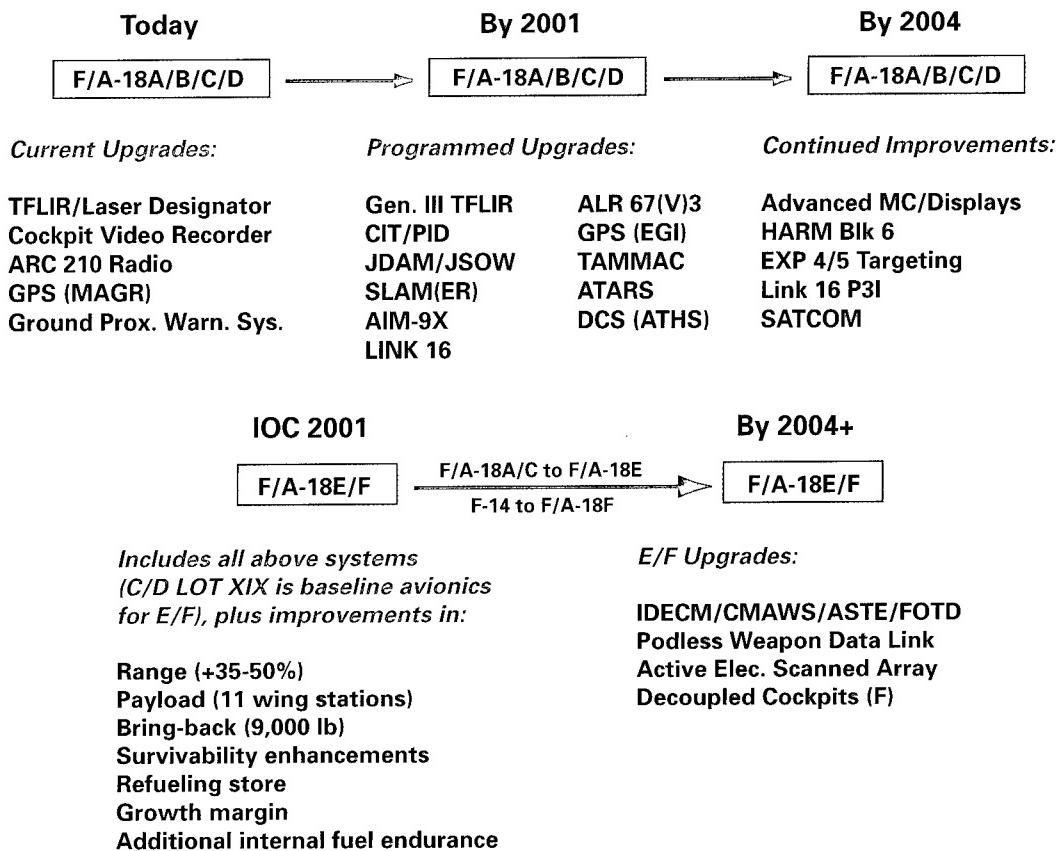


The introduction of the F/A-18E/F Super Hornet to the Fleet in 2000 will provide critical growth capacity, weapon bring-back improvements, survivability enhancements, and range/payload improvements, all of which are required to keep the

strike-fighter force lethal and viable well into the 21st century. There will be extensive commonality with weapons systems, avionics, and software between F/A-18 variants. The infrastructure needed to support the Super Hornet will build upon existing organizations. Ultimately, the F/A-18E will replace older F/A-18s while the two-seat F/A-18F will replace the F-14. The lethality, flexibility, reliability, and survivability of the F/A-18E/F will make it the right aircraft to fulfill the majority of missions associated with regional and littoral conflicts.



F/A-18E/F Roadmap



F/A-18E/F Enhancements

<i>Range/Endurance:</i> Increase 35-50%	<i>Growth:</i> 20-year growth margin
<i>Payload:</i> 11 wing stations Joint/precision weapons Additional 3,600 lb internal fuel	<i>Aerial Refueling:</i> Refueling store 5 wet stations
<i>Recovery Payload:</i> 9,000 lbs	<i>Survivability:</i> Reduced signature Reduced vulnerable area Improved ECM Improved expendables

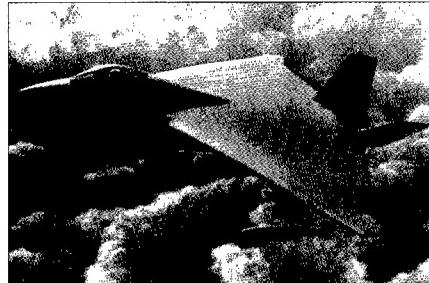
JOINT STRIKE FIGHTER

The Joint Strike Fighter (JSF) program, formerly the Joint Advanced Strike Technology (JAST) program, will develop and field a tri-service family of next-generation strike aircraft with an emphasis on affordability. The "family of aircraft" concept allows a high level of commonality while meeting unique service and allied needs. The United Kingdom is a collaborative partner in the program; other nations are also likely to participate.

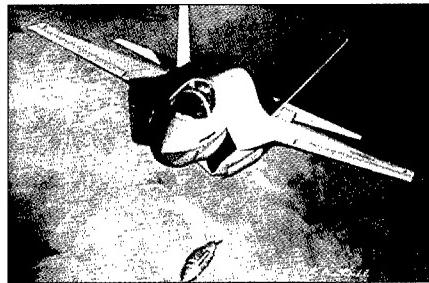
The focus of the JSF effort is to reduce the costs of developing, producing, and owning these aircraft. The program is accomplishing this by facilitating the Services' development of fully validated, affordable operational requirements, and by lowering technical risk by investing in and demonstrating key leveraging technologies and operational concepts prior to the start of Engineering and Manufacturing Development (E&MD).

In November 1996, designs from two contractors — Lockheed Martin and Boeing — were selected to compete in the JSF Concept Demonstration Phase. This phase will feature flying concept demonstrators, ground and flight demonstrations, and continued refinement of weapon system concepts. Both contractors will demonstrate their design's commonality and modularity characteristics, STOVL hover and transition to forward flight, and low-speed handling qualities. Pratt and Whitney is providing engine hardware for the concept demonstration phase, while General Electric continues its technical efforts to develop an alternate engine source for production aircraft. The Concept Demonstration phase is designed to lead to an affordable and low risk transition to the E&MD phase in 2001. The first operational aircraft will be delivered in 2008.

This joint approach to the JSF's development is anticipated to produce significant savings when compared to the costs of separate programs. The government and industry team is converging on a design concept which, when coupled with other technology "building blocks," will result in continuing U.S. technological superiority at an affordable price.



Courtesy of Boeing



Courtesy of Lockheed-Martin

JSF REQUIREMENTS

U.S. Navy:

Stealthy, multi-role strike-fighter aircraft to complement the F/A-18E/F.

U.S. Marine Corps:

Multi-role, Short Take-off/Vertical Landing (STOVL) aircraft to replace the AV-8B and F/A-18A/C/D

U.S. Air Force:

Multi-role aircraft to replace the F-16 and A-10 and complement the F-22

United Kingdom Royal Navy:

Supersonic STOVL aircraft to replace the Sea Harrier

AIRBORNE RECONNAISSANCE VISION

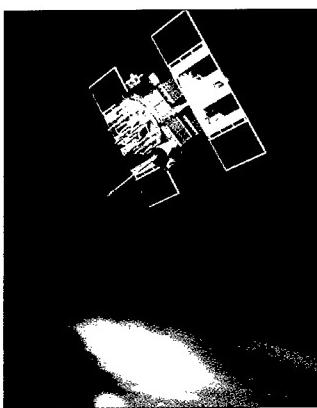


Naval Aviation systems are key contributors to the Defense Department's Integrated Airborne Reconnaissance Strategy. The Navy and Marine Corps broad objective for airborne reconnaissance is to achieve rapid full-spectrum dominance, on the battlefield or during operations other than war. Our specific reconnaissance goal is to provide all warfighters with timely, useful, and sustained intelligence.

The unique expeditionary capabilities of U.S. naval forces allows them to bring early and extended reconnaissance capabilities to undeveloped areas of operation. Wherever the United States has naval forces deployed, it also has an in-place strategic intelligence collection capability that supports the National Command Authority, the unified

CINC, and the Joint Task Force commander. At the tactical level, real-time airborne intelligence provides a means to support early strikes and the precision engagement of stationary and mobile enemy forces and facilities.

OPERATIONAL STRATEGY

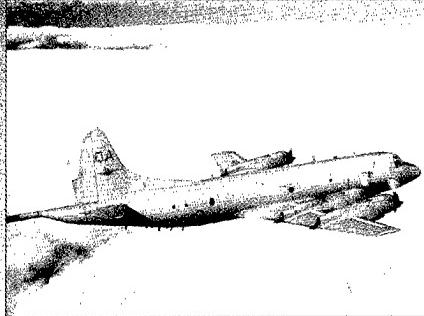


Naval Aviation's strategy for providing airborne reconnaissance relies upon a systematic approach, one that — in concert with space-based and other joint assets — will meet U.S. warfighting needs through 2010. The desired endstate is a force of manned and unmanned aircraft that is integrated into a broader joint infrastructure and complies with the common format architecture mandated by the Department of Defense. To achieve this force mix, we are assessing the value and cost of existing analog systems while basing our procurement plans on how well these systems perform on the joint digital battlefield. Our ultimate goal is to achieve true, real-time sensor-to-planner intelligence at the strategic/theater level, and sensor-to-shooter targeting at the operational and tactical levels.

Navy airborne reconnaissance platforms are organic ISR assets that are key to naval, and U.S., power projection. These aircraft must be able to provide ISR data to a variety of weapon systems and platforms via the most direct and expeditious means possible. The measure of effectiveness for Naval Aviation's airborne reconnaissance platforms is the extent to which they allow the prompt placement of the appropriate weapon on the correct target. Consequently, they must be participants in joint information networks in which intelligence and situational awareness data from all available sources are fused and disseminated. The two primary joint communication links Naval Aviation will use are JTIDS/Link 16 and the Tactical Information Broadcast System/Information Broadcast System (TIBS/IBS). These joint information "pipes" are being incorporated into naval reconnaissance aircraft.

MANNED TACTICAL AIRBORNE RECONNAISSANCE

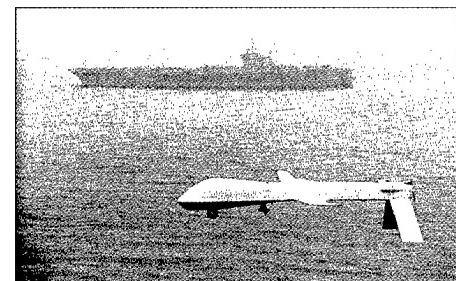
Battle group and MAGTF commanders need the capability to immediately dispatch tactical reconnaissance platforms to update the enemy's order of battle, locate and track mobile targets, transmit target imagery, and provide timely battle damage assessment. Stand-off, high endurance reconnaissance is provided by EP-3E's and ASUW Improvement Program (AIP)-equipped P-3C's utilizing multiple sensors including Electro-optic sensors and high-resolution SAR radars. All future airborne reconnaissance systems must be compatible with the Common Imagery Ground Service System (CIGSS), and current systems must become CIGSS-capable as they are upgraded. Naval Aviation meets this requirement with F-14 TARPS, the only manned penetrating reconnaissance aircraft in the U.S. inventory.



The Marine Corps Advanced Tactical Airborne Reconnaissance System (ATARS), an internally-mounted, palletized system carried by the F/A-18D, will replace the capabilities lost when the Marine Corps retired its RF-4B reconnaissance aircraft in the early 1990s. The Navy will develop a reconnaissance system for the F/A-18F (F/A-18F TACRECCE) that will replace the F-14 TARPS. The Tomcat will continue to provide the only manned tactical reconnaissance capability until the introduction of ATARS. The F-14's "Roadmap for the Future" includes the incorporation of a digital imaging and data link capability in 24 TARPS pods to provide battle group commanders and allied forces tactical battlefield imagery in support of ongoing intelligence gathering requirements. The TARPS digital imaging (DI) system will provide near real time imagery for detection and identification of tactical targets and immediate threat and bomb damage assessment. This unique, one-of-a-kind, capability deployed with Tomcat squadron VF-32 in November 1996. Both systems will provide Naval Aviation with armed, penetrating, rapid-response tactical reconnaissance capability. They will provide real-time or near real-time, high-resolution, digital, day/night, all-weather and through-the-weather reconnaissance, either by direct overflight or from stand-off ranges. The F/A-18D ATARS will reach Marine Corps IOC in the second quarter of FY 1999, while the Navy's F/A-18F TACRECCE will debut operationally around FY 2003-2004.

UNMANNED AERIAL VEHICLE TACTICAL RECONNAISSANCE

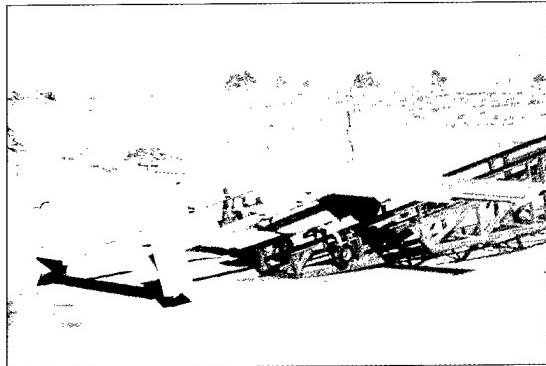
The Naval Services must be capable of receiving intelligence data via direct link from the entire joint inventory of UAV variants, whether they are land- or sea-based. The operational concepts of *Forward... From the Sea* and *Operational Maneuver from the Sea* are based upon agility, the collection of timely intelligence, and flexibility. The Department of the Navy can meet these demands either with organic UAVs or by leveraging the capabilities of other-service UAVs via direct data link. Organic UAVs



must be capable of landing with expeditionary forces, as well as operating with a variety of naval warships. UAVs that operate in support of U.S. naval forces must provide tactical reconnaissance out to the maximum ranges of the weapon systems and aircraft of a carrier battle group or MAGTF.

Until a fully marinized Tactical UAV (TUAV) system is developed, the retention of the Pioneer UAV — the Department of the Navy's only operational UAV system —

will remain a Naval Aviation priority. Capable of operating from LPD-class amphibious ships and from shore locations, Pioneer has proven extremely useful in supporting amphibious and expeditionary operations.



take-off and landing technologies, which may be incorporated into the TUAV that supports the Navy and Marine Corps.

Naval Aviation also remains committed to demonstrating Medium Altitude Endurance (MAE) UAV technologies as part of an overall effort to refine our UAV requirements and develop concepts of operations in which they are featured. The Naval Strike and Air Warfare Center is addressing these requirements and examining manned versus unmanned force mix issues.

Naval Aviation's interest in the High-Altitude Endurance (HAE) UAV system is directed toward three areas. One involves the ability to task HAE UAV missions, retask the aircraft's route of flight, and redirect its sensors to support either joint or naval operations. The second area is the ability to receive HAE sensor data in real-time, and the third is the ability to process sensor data afloat and on shore.

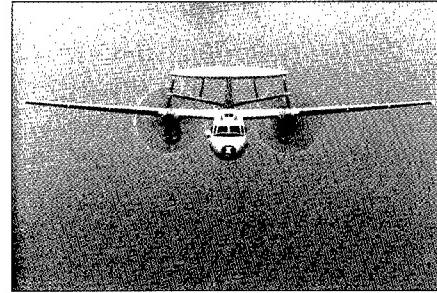
In the area of UAV support and control, the Tactical Control Station (TCS) is being designed to be a common link between all UAV systems. TCS will be used to control the TUAV, while its secondary function will be to receive Imagery Intelligence data from Endurance UAVs. TCS will be a key element in the Naval Services' ability to receive and disseminate UAV-collected intelligence.

E - 2 C H A W K E Y E

The E-2C Hawkeye is the Navy and Marine Corps airborne surveillance and command-and-control platform, providing battle management and support of decisive power projection at sea and ashore in a joint architecture. In addition to current roles, the E-2C has an active and extensive upgrade and development program to fully prepare it to be a critical element in an overall joint theater and missile defense program.

The Hawkeye force is keeping pace with changing tactical environments via two major upgrades: the E-2C Group II upgrade, and the Radar Modernization Program (RMP). The most advanced Hawkeye variant, the E-2C Group II which is in production today features:

- Extended radar range (40 percent greater than previous E-2 aircraft)
- Improved overland detection capability
- Color displays
- JTIDS, GPS and voice satellite communications.

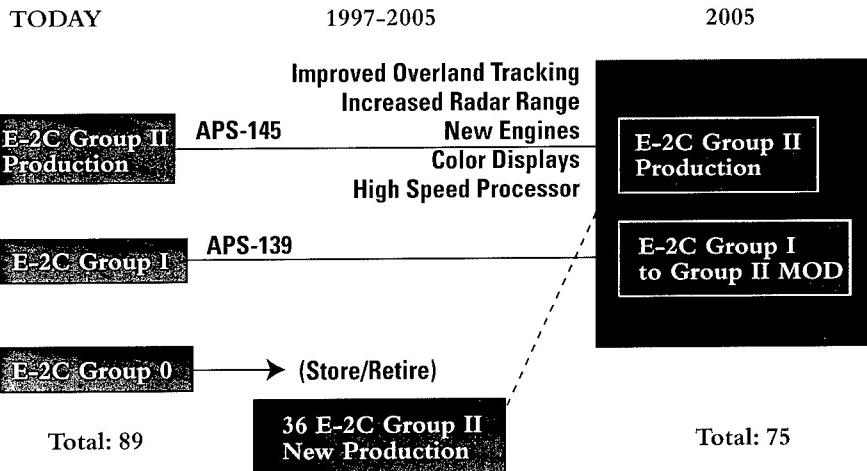


The next upgrade, the Hawkeye 2000, will install a Mission Computer Upgrade and Cooperative Engagement Capability, enhancing the E-2's capabilities in the multiple threat environment anticipated in the 21st century. The Mission Computer Upgrade will improve target detection and tracking, and enable the incorporation of CEC. In turn, CEC equipped Hawkeyes — the E-2C is the first aircraft in the U.S. aviation arsenal to incorporate this system — will significantly extend the engagement capability of surface forces. The CEC equipped Hawkeye is the key to early cueing of the Aegis weapons system, dramatically extending the lethal range of the Standard missile against airborne low altitude low radar cross section targets.

The Radar Modernization Program is developing an advanced demonstration radar for the Hawkeye that will bring over-the-horizon precision, overland detection and tracking to the battle group. This, coupled with CEC, will fully integrate the Hawkeye into the Theater Missile and Cruise Missile Defense role. This precision tracking capability in conjunction with the Aegis and Standard missile will allow the battle group to deploy an organic, theater-wide cruise missile and theater ballistic missile defense umbrella for protection of high priority defended areas and U.S. and coalition forces. Additionally, the E-2's systems are fully interoperable with the Airborne Warning and Control System and ground-based systems so that transition to a full joint architecture can occur seamlessly and smoothly.

The Navy is ensuring that the E-2C continues as the "eyes and ears" of the Fleet as it applies the aircraft's capabilities in the integrated joint, overland, theater-wide air and missile defense environment. Many of the technological improvements being incorporated in the Hawkeye represent leading edge improvements not just in the Navy's theater air and missile defense posture, but in that of all U.S. forces.

E-2 Modernization "Roadmap"



S - 3 B VIKING



The S-3B Viking provides multimission support to battle group and joint commanders in the antisurface, antisubmarine, electronic surveillance, overland strike support, mine warfare, and aerial refueling roles. Ongoing service-life initiatives will allow the Viking to remain in service until FY 2015.

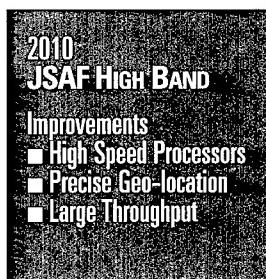
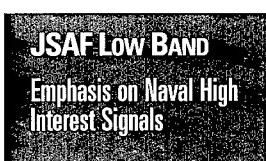
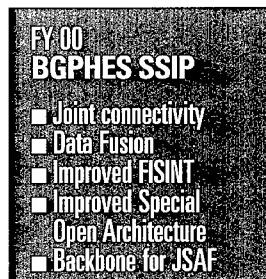
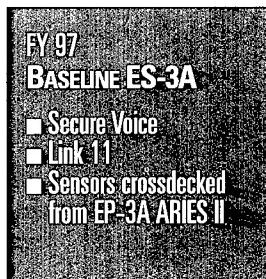
The current avionics upgrade program replaces obsolete or high-maintenance safety of flight avionics systems. This effort includes the replacement of autopilot components, electronic flight instruments, and the Carrier Aircraft Inertial Navigation System with digital, highly reliable, COTS/NDI systems. Future planned efforts will replace obsolete tactical displays and the high-maintenance Armament Control System, resulting in improved in-flight weapons stores control and carriage.

Other avionics modifications will improve the Viking's mission computer, communication suite, and navigation systems. The AN/AYK-23 computer upgrade replaces the obsolete AN/AYK-10 General Purpose Digital Computer and ASW mission-specific components with a single VME-based processor. Two obsolete AN/ARC-156 UHF radios will be replaced with two AN/ARC-187s and one AN/ARC-182 (VHF) radio suite. This suite will preserve current Link-11 capability while adding on-line VHF and satellite communications using an advanced narrowband



ES-3A

1997-2010



2010



digital voice terminal. All S-3 aircraft will be GPS operational by the end of FY 2000.

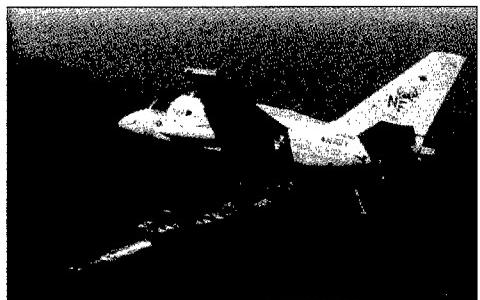
In the area of antisubmarine warfare, the S-3B will be the first aircraft to receive the Improved Extended Echo Ranging/Air Deployable Active Receiver. This active search capability will significantly improve S-3B ASW effectiveness in the littoral operating environment.

The S-3B Weapon System Improvement Program (Phase II) is in the planning stage. The program incorporates separate system modifications and upgrades required to improve S-3B multimission capabilities in the joint warfare environment. The program includes:

- Inverse Synthetic Aperture Radar/Synthetic Aperture Radar with moving target indicator
- High resolution, multi-function Forward Looking Infrared (FLIR)/Low-Level Light TV/Laser Range Designator
- Officer in Tactical Command Information Exchange System (OTCIXS) connectivity with JMCIS
- Stand-off air-to-surface weapon with pre-launch target discrimination capability.

E S - 3 A S H A D O W

The ES-3A Shadow is carrier aviation's principal signals intelligence (SIGINT) reconnaissance aircraft. This electronic reconnaissance aircraft supports all facets of Navy, Marine Corps, and joint operations. As one of carrier aviation's newest additions, the ES-3A has already demonstrated tremendous reliability and safety, as well as a robust mission capability.



In addition to its ability to exploit enemy electronic emissions, the aircraft will be able to link its receivers to terminals on ships or in ground stations, providing surface operators the capability to exploit targets far beyond their radio horizon. This new capability is embodied in the Battle Group Passive Horizon Extension System (BGPHES), and is scheduled for a prototype deployment in 1997 with the USS *John F. Kennedy* (CV 67) battle group.

The ES-3A will also undergo significant mission upgrades through a sensor improvement program. This will provide complete connectivi-

ty with a number of tactical data links. Mission software improvements will, for the first time, link off-board sensors with on-board sensors, giving Shadow crews a total, integrated picture of the battlespace. The same picture will also be sent in near real-time to other warfighters.

COMMON SUPPORT AIRCRAFT

The Common Support Aircraft (CSA) will serve as the Navy's carrier-based surveillance, control, and support aircraft for the 21st century, replacing existing S-3B, ES-3A, E-2C, and C-2A aircraft. Envisioned as a single aircraft design, the CSA will be able to carry different mission suites of sensors and avionics in order to fulfill future mission requirements and will possess significant capacity for logistics support and aerial refueling. CSA will facilitate naval fires in the joint warfare battlespace with fused tactical data obtained from both on- and off-board sensors and with its organic warfighting capability.

CSA STUDY SYNOPSIS

In 1993, a Naval Aviation study concluded that a "neckdown" of follow-on aircraft was the only affordable procurement strategy for future naval aircraft. Current investments in E-2C production, ongoing C-2 service life extension, and service life extension plans for the S-3 and ES-3 aircraft are needed to ensure that current airframes achieve the 2015 service life goal. Based on current fleet utilization rates and projected support aircraft inventories, the CSA will require a 2012 initial operational capability at the latest. Efforts are being explored to determine if an accelerated profile is feasible.

The study team has established CINC Coordination and Fleet User Teams to ensure the operational concerns of U.S. warfighters are highlighted, and to provide a forum that spans all warfare areas. Phase 1 defined future mission requirements by using top down, strategy-task-technology and quality function deployment methodologies that were rooted in joint military objectives. Phase 1 concluded in early 1997.

During Phase 2, the study will evaluate the technical and economic feasibility of a single airframe vehicle. First, the mission concept of operations in tactical situations will quantify performance values. Existing guidance will be used to examine the aircraft design possibilities for a multi-place aircraft sharing a common airframe, engines, and core avionics and having sufficient internal volume and carriage capability for mission-specific avionics, sensors, stores and weapons. The study group is also working with industry and examining advances in technology and the acquisition process to assess the feasibility of the CSA.

CSA INITIATIVE

The CSA initiative is to commence a baseline development effort for the air vehicle prior to final weapon systems determination for the various mission variants. Based on the current and future "worst case" avionics suite, the baseline aircraft will be sized around the Hawkeye 2006 mission system which will provide growth potential for other mission-area requirements and avionics upgrades. Significant work in formulating plans, options and contingencies are ongoing within the Fleet, acquisition community, and industry so that a streamlined effort can be initiated that minimizes program risk while exploiting commercial best practices and methodologies.

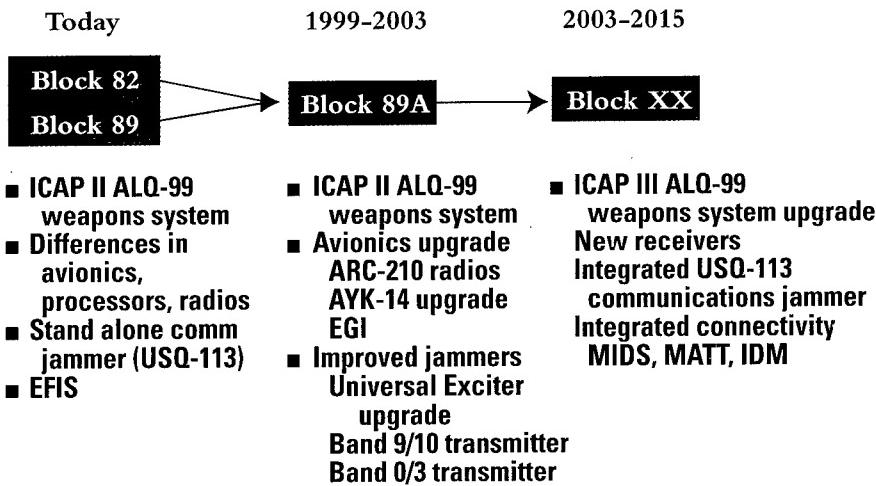
EA - 6 B PROWLER

The EA-6B Prowler electronic warfare aircraft — which played a key role in suppressing enemy air defenses during Operation Desert Storm — enhances the strike capabilities not only of carrier air wings but of U.S. Air Force and allied forces as well. The decision to retire the Air Force EF-111A Raven and to assign all Department of Defense radar jamming missions to the Prowler adds to the significance of the EA-6B in joint warfare. With its jamming and High-Speed Anti-Radiation Missile (HARM) capability, the Prowler is a unique national asset that will be deployed from land bases and aircraft carriers. Its ability to monitor the electromagnetic spectrum and actively deny an adversary's use of radar and communications is unmatched by any airborne platform worldwide.

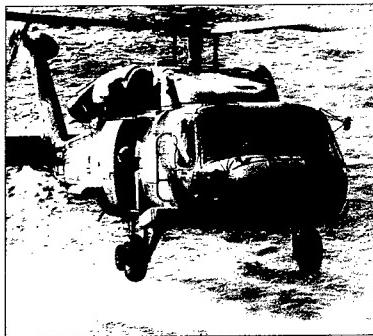
In the coming years, the Prowler fleet will be modernized and upgraded to keep the aircraft and its systems abreast of evolving threats and to maintain aircraft safety. The Block 89A upgrade program will address structural and supportability problems associated with aging aircraft and includes numerous avionics improvements for safety of flight and joint interoperability.

Later improvements to the Prowler's AN/ALQ-99 tactical jamming system, including the Improved Capabilities (ICAP) III upgrade, new high and low frequency transmitters, and continuing structural enhancements, will ensure that the EA-6B remains the world's premier tactical electronic warfare platform and a force multiplier for years to come.

EA-6B Modernization Roadmap



THE HELICOPTER MASTER PLAN



Helicopters are vital to the execution of numerous Navy missions. The Navy will be “necking down” to fewer types of helicopters in the future, but rotary-wing requirements will not lessen.

The Helicopter Master Plan sets forth the following taskings:

- Develop a helicopter force structure to meet present and future requirements until FY 2020 in the antisubmarine warfare, antisurface warfare, mine warfare, combat search and rescue, special operations, and vertical replenishment mission areas
- Reduce costs and infrastructure
- Make Naval Reserve forces mirror active Navy forces
- Support air station search and rescue, range support, and other miscellaneous missions.

The plan calls for expanding warfighting capabilities, modernizing the force, necking down to three aircraft types, and consolidating force structure where possible. To meet the new taskings, the Navy is making the changes described below:

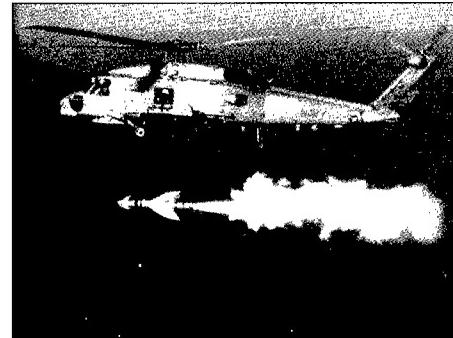
CH-60

The Navy will procure sufficient numbers of CH-60 helicopters to replace the CH-46D Sea Knight, HH-60H Seahawk, and H-3 Sea King. The CH-60 is the future aircraft for combat search and rescue, special operations, and logistics helicopter forces in the Navy. Combining the tested and battle proven U.S. Army UH-60 Blackhawk

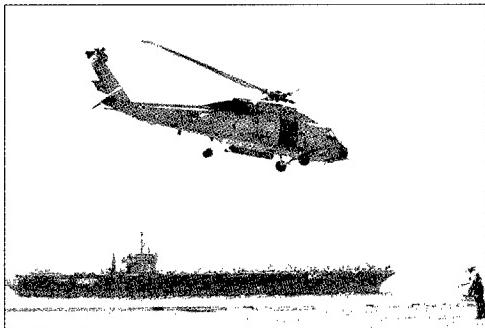
fuselage and Navy SH-60 Seahawk dynamic components, the CH-60 promises to be a superb aircraft. The commonality bred into the helicopter not only contributes to mission effectiveness, but will provide logistics and acquisition efficiencies. A CH-60 demonstrator will fly in the summer of 1997, with full production currently scheduled for FY 1999. The CH-60 is the linchpin of the Helicopter Master Plan.

SH-60B/F

The SH-60B Seahawk is the air component of the LAMPS Mk III weapon system integrated with the Navy's surface combatant forces. Seahawks have exceeded all Fleet requirements since their first deployment in 1984. The primary missions of the Seahawk are antisubmarine warfare and



antisurface warfare. It also supports secondary missions of electronic warfare and command, control, and communications — as well as the traditional helicopter roles of search and rescue and logistics. The SH-60F Seahawk, a specialized variant embarked in aircraft carriers, provides close-in undersea warfare protection to the battle group. First deployed in 1991, this aircraft is equipped with active dipping sonar and sonobuoy processing for the ASW mission. The SH-60F also contributes to maritime interdiction operations, search and rescue operations, and logistics support.



SH-60R

The conversion of all SH-60B and SH-60F helicopters to SH-60R or SH-60R(V) will provide a true multimission helicopter force. The SH-60R upgrade involves the remanufacture of existing Seahawk variants into an aircraft that will carry the Navy's tactical helicopter community through 2020. Along with a Service Life Extension Program for the airframe, the SH-60R will incorporate an advanced multi-mode, Inverse Synthetic Aperture Radar, the Airborne Low Frequency (dipping) Sonar, and an upgraded computer suite that will significantly improve the multimission ability of the SH-60 weapons system.

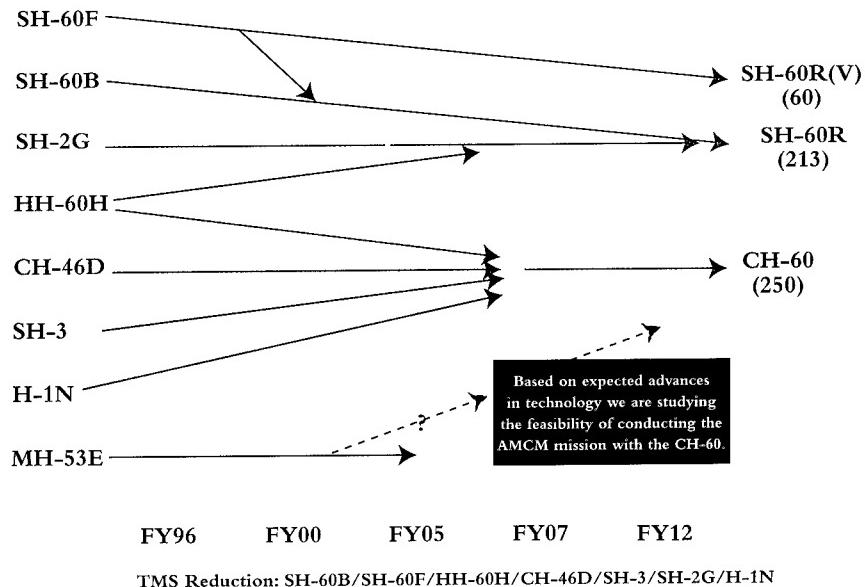


HH-60H

The HH-60H is also assigned to carrier air wings and performs the missions of combat search and rescue and special operations warfare support. Capable of executing either mission from air-capable ships as well as from unprepared sites ashore, the incorporation of FLIR coupled with Hellfire missiles and an enhanced survivability package will continue to provide the task force commander with a potent multimission force multiplier well into the next century.

HELO MASTER PLAN

Current Roadmap



Other aspects of the Navy's Helicopter Master Plan include:

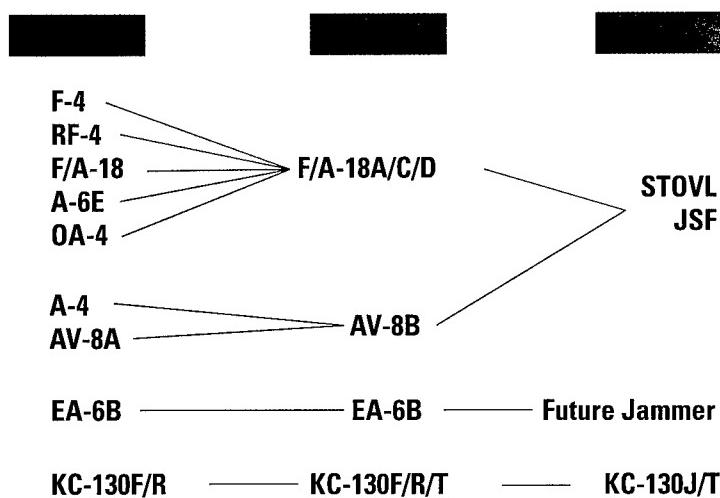
- Outsourcing to employ commercial helicopters and crews to perform logistics support missions for Military Sealift Command (MSC) ships — if this concept proves to be operationally and economically feasible. (MSC ships are civilian-manned and provide logistics support to operational naval forces, as well as point-to-point transportation for all Department of Defense activities and agencies). Outsourcing is only one option Naval Aviation is closely examining to ensure it provides the nation with the most robust force possible given the limited defense budgets.
- Consolidating the Helicopter ASW Squadron (HS) and Helicopter Combat Support Squadron (HC) communities to support aircraft carriers, fast combat support ships (AOEs), and amphibious ships. AOEs normally operate in direct support of carrier battle groups. Under this concept, carrier-based helicopter squadrons will support the AOEs while amphibious ships will be provided with rescue/utility helicopters from shore-based squadrons. (This is a separate function from the Marine assault and gunship helicopters that operate from these amphibious ships).

MARINE CORPS FIXED-WING AIRCRAFT

Marine Corps fixed-wing aircraft support the MAGTF in all six functional warfare areas. In support of the Commandant's Planning Guidance, a strategy of "necking down" the number of aircraft models is being implemented. In the future, the Marine Corps inventory will consist of two or three fixed-wing aircraft types. This reduction supports the expeditionary nature of the MAGTF by reducing aviation's logistical footprint. Replacement of the AV-8B and the F/A-18 with the STOVL version of JSF will further the goal of achieving an all-STOVL aviation component.



Fixed-Wing Neckdown Strategy



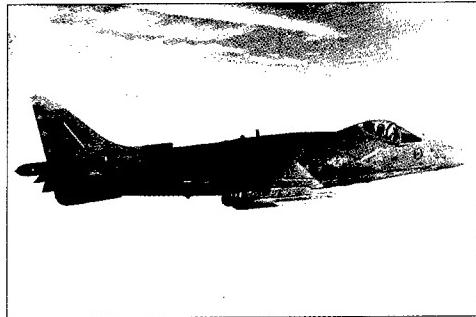
THE JOINT STRIKE FIGHTER

The family of JSF aircraft will include a STOVL variant for the U.S. Marine Corps and the Royal Navy. Marine Corps requirements for this aircraft are focused on readiness, expeditionary capability, and the combined arms concept. The primary missions for the Marine Corps Joint Strike Fighter will remain close air support, interdiction, and anti-air warfare. Secondary missions will include suppression of enemy air defenses, command and control of aircraft and missiles, and reconnaissance. Delivery of this aircraft, beginning about 2008, will begin the final phase of the Marine Corps drive for an all-STOVL aviation component, and will solve its fixed-wing aging and attrition problems.

AV-8B HARRIER II

The AV-8B Harrier is a single-seat, light attack aircraft that provides offensive air support to the MAGTF. By virtue of its vertical/short-takeoff or landing capability, the

AV-8B can operate from a variety of amphibious ships, from rapidly constructed expeditionary airfields, from forward sites (e.g., roads), and from damaged conventional airfields. This makes the aircraft particularly well-suited for providing dedicated close air support.



There are three variants of the aircraft currently in service: the Day Attack, Night Attack, and Radar/Night Attack Harrier. The Night Attack Harrier improved upon the original AV-8B design through incorporation of a Navigation, Forward-Looking Infrared (NAVFLIR) sensor,

a moving map, night vision goggle compatibility, and a higher performance engine.

The current Radar/Night Attack Harrier, or Harrier II+, has all the improvements of the Night Attack aircraft *plus* the AN/APG-65 multimode radar. The fusion of night and radar capabilities allows the Harrier to be responsive to the MAGTF's needs for expeditionary, night and adverse weather, offensive air support.

The ongoing "remanufacture" program, in which 72 day-attack aircraft from the current inventory are being rebuilt to the Radar/Night Attack standard, extends the service life of these Harrier aircraft into the next century, and greatly improves their warfighting capabilities. Existing Harriers are also being upgraded through the use of COTS technology. The Open Systems-Common Architecture program will replace the existing Harrier Mission Computer with a COTS system that can be more affordably upgraded and maintained. The aircraft's weapons and communications systems will continue to be upgraded until it is replaced by the JSF.

EA-6B PROWLER

The EA-6B provides electronic warfare support to the MAGTF. The Prowler is used to intercept, interpret, and record enemy electronic emissions. Information from such intercepts can be disseminated to other agencies while the crew is still airborne or

after post-mission processing of recorded data. The aircraft also provides active radar jamming support to both attack and assault support aircraft, as well as ground units. Lethal capability against enemy air defenses is provided by HARM.

Marine EA-6B squadrons are unique in regard to their integration with the Tactical Electronic Processing and Evaluation System (TERPES). This organic electronic reconnaissance and processing system provides the MAGTF commander with valuable Tactical Electronic Order of Battle information and access to national sensors. The system and its supporting analysts are colocated with the EA-6B squadron and other tactical aircraft requiring support.

The ongoing Block 89A upgrade program will address structural and supportability problems associated with the aging aircraft fleet. The upgrade also includes numerous avionics improvements for safety of flight and joint interoperability, including the ICAP-III program upgrade that Navy Prowlers are undergoing.

F/A-18A/C HORNET

The F/A-18 Hornet fulfills both the offensive air support and anti-air warfare mission areas. The maintainability, reliability and multimission capabilities of the F/A-18 make it particularly well-suited to the needs of the MAGTF in an expeditionary environment.



F/A-18Cs delivered since FY 1990 have increased night and marginal-weather capability. This improvement comes through incorporation of several avionics updates, including a color moving map display, night vision goggle-compatible lighting and a NAVFLIR sensor. These capabilities, as well as a wide range of compatible air-to-air and air-to-ground weapons and a precision targeting system make the Hornet a versatile multimission platform.

Procurement of new F/A-18Cs for the Marine Corps ended in FY 1996. The aircraft's weapons and communications systems will continue to be upgraded until it is replaced by JSF.

F/A-18D HORNET

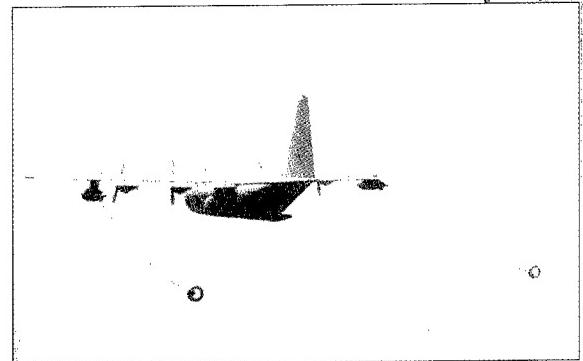


The F/A-18D is a two-seat version of the F/A-18C Hornet. Like the single-seat variant, the F/A-18D provides offensive air and anti-air warfare support to the MAGTF. The aircraft also functions in the control of aircraft and missiles mission area by acting as a Forward Air Controller (Airborne)/ Tactical Air Controller (Airborne) (FAC(A)/TAC(A)) and by providing Strike Control and Reconnaissance (SCAR). Like later model F/A-18Cs, the D model's avionics suite allows it to conduct night operations below the weather using night vision goggles and FLIR systems.

In the future, an additional warfare area — aerial reconnaissance — will be added to the aircraft's repertoire. The Advanced Tactical Airborne Reconnaissance System will permit the F/A-18D to provide real-time aerial imagery to the MAGTF, naval forces at sea, or joint forces ashore via a digital data link. This system is scheduled for deployment in FY 1999.

KC-130 HERCULES

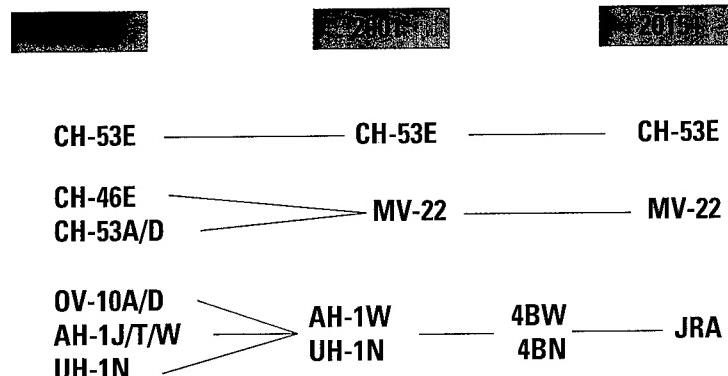
The KC-130 is a multi-role, multimission tactical tanker and transport aircraft, well-suited to the mission needs of the forward-deployed MAGTF. The only long-range assault support capability organic to the Marine Corps, this aircraft provides both fixed-wing and rotary-wing tactical in-flight refueling; rapid ground refueling of aircraft or tactical vehicles, assault air transport of air-landed or air-delivered personnel, supplies and equipment; command and control augmentation; pathfinder; battlefield illumination; tactical aeromedical evacuation; and search and rescue support. The new KC-130J, with its increase in speed, range, improved air-to-air refueling system, night systems, and survivability enhancements, will provide the MAGTF commander with a state-of-the-art, multimission, tactical aerial refueler/transport well into the 21st century.



MARINE CORPS ROTARY-WING AIRCRAFT

Marine Corps rotary-wing aircraft support the MAGTF in the areas of assault support, offensive air support, and control of aircraft and missiles. The Marine Corps is necking down the number of rotary-wing models that it operates to four — and even that number could be reduced to just three aircraft models in the future.

Rotary-Wing Neckdown Strategy



MV-22 OSPREY

The MV-22 Osprey is a tilt-rotor,V/STOL aircraft designed to replace the CH-46E and CH-53D aircraft presently operated by the Marine Corps. The MV-22 will be an integral part of the "amphibious triad"—the MV-22, the Advanced Amphibious Assault Vehicle (AAAV), and the Landing Craft Air Cushion (LCAC)—necessary to execute the concept of Operational Maneuver from the Sea (OMFTS). The MV-22 is capable of carrying 24 combat-equipped Marines or a 10,000-pound external load, and deploying 2,100 nautical miles with a single aerial refueling. The MV-22's rotor system and engine/transmission nacelle mounted on each wingtip allow it to operate as a helicopter for takeoff and landing. Once airborne, the nacelles rotate forward 90 degrees, converting the MV-22 into a high-altitude, fuel-efficient turboprop aircraft.

The program is currently in the Engineering and Manufacturing Development phase. The aircraft has completed Operational Assessment IIB, high/hot hover performance trials, and has accrued over 1,100 flight hours with the Full Scale Development and E&MD aircraft. The Osprey enters the Developmental Test/Operational Test phase in 1997; aircraft deliveries to operating forces begin in 1999 and initial operational capability is scheduled for 2001.



AH-1W SUPER COBRA AND UH-1N HUEY

The AH-1W is a two-place, twin-engine attack helicopter capable of land- or sea-based operations. It provides close air support under day/night and adverse weather conditions. Additionally, it provides anti-armor/anti-helicopter operations, armed escort, armed and visual reconnaissance, and supporting arms coordination. With incorporation of the Night Targeting System (NTS), the Cobra can provide day/night precision targeting and laser designation. The UH-1N is a combat utility helicopter that provides airborne command and control as well as supporting arms coordination, medical evacuation, maritime special operations, insertion/extraction, and search and rescue.

The H-1 Upgrade program replaces the current two-bladed rotor systems on the UH-1N and AH-1W aircraft with a new, four-bladed, all-composite rotor system coupled with a sophisticated, fully integrated cockpit and state-of-the-art technical enhancements. This 4BN/4BW remanufacture program reduces life-cycle costs, significantly improves operational capabilities, resolves existing safety deficiencies, and extends the service lives of both aircraft. Commonality between aircraft greatly enhances the maintainability and deployability of the systems with both aircraft supported and operated within the same squadron structure.



CH-46 SEA KNIGHT

The CH-46E Sea Knight helicopter is a day/night assault transport of combat troops, supplies, and equipment during amphibious landings and subsequent operations ashore. Additional tasks are evacuation operations and other maritime special operations; over-water search and rescue augmentation; support for mobile forward refueling and rearming points; and aeromedical evacuation of casualties from the field.



Normal airframe operational and attrition rates have taken the CH-46 force to the point where a medium lift replacement is required. Several safety and capability upgrades — interim measures to allow continued safe and effective operation of the Sea Knight fleet until its replacement by the MV-22 — are currently in work, including: a dynamic component upgrade, a communication/navigation control system, Night Vision Goggle Head-Up Display (NVG HUD), GPS, and AN/ARC-210 radios.

CH-53D SEA STALLION

A more capable version of the CH-53A introduced into the Marine Corps in 1966, the CH-53D Sea Stallion is designed to transport equipment, supplies, and personnel during the assault phase of an amphibious operation and subsequent operations ashore.

Capable of carrying supplies both internally and externally, the CH-53D is shipboard compatible and capable of operation in adverse weather conditions both day and night. It can carry 37 passengers in its normal configuration and 55 passengers with centerline seats installed.



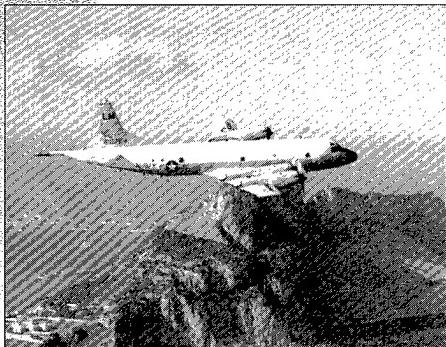
The CH-53D is being used in the Marine Corps medium lift helicopter fleet until its replacement by the MV-22 Osprey. Funded operational safety improvement programs, including GPS, AN/ARC-210 radios, FLIR, and NVG HUD, will ensure that the aircraft remains capable until its retirement.

CH-53E SUPER STALLION

The CH-53E is the Marine Corps heavy-lift helicopter. The aircraft is capable of lifting 16 tons at sea level, transporting the load 50 nautical miles, and returning. The CH-53E can be refueled in flight, giving the helicopter a virtually indefinite range. The aircraft is compatible with most amphibious warships. It seats 37 passengers in its normal configuration and has provisions to carry 55 passengers with centerline seats installed. The CH-53E Super Stallion provides the MAGTF the capability to deliver heavy and oversized cargo, artillery, and light armor vehicles. It also provides a rapid combat resupply opportunity when needed. Funded operational safety improvement programs for the aircraft include GPS, AN/ARC-210 radios, and NVG HUD.



P - 3C ORION



The P-3C Orion provides effective undersea warfare, antisurface warfare, and C⁴/ISR capabilities to naval and joint commanders. The current force of 12 active and eight reserve squadrons supports the theater and fleet commanders requirements for 40 P-3Cs continuously forward-deployed. Orions provide long-range, high-endurance support to aircraft carrier battle groups and amphibious ready groups.

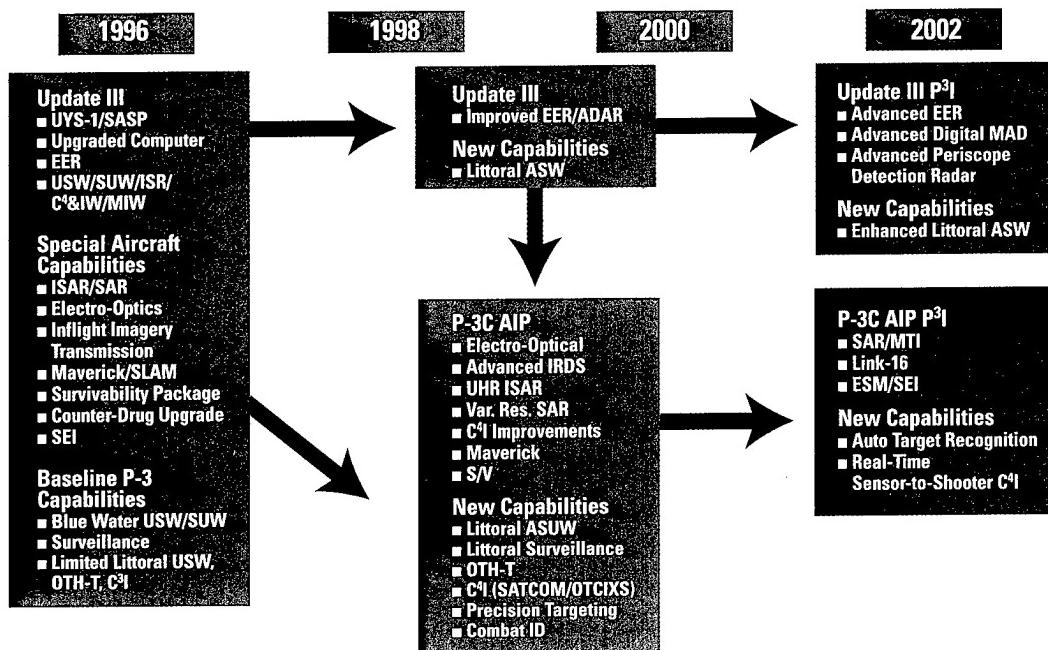
The Navy's P-3 modernization plan is focusing on providing a more tailored force optimized for regional and littoral conflict. The key elements of the plan are mission system upgrades, sustaining inventory, and reducing multiple configurations. The specific programs include:

P-3C UPDATE III — The conversion of remaining P-3C aircraft to the Update III digital system architecture will result in one common fleet (active and reserve) configuration. Update III is the baseline configuration required to use advanced sensors and weapons. This program will enhance interoperability, replace obsolete components, and reduce support costs of maintaining varied avionics-configured airframes.

ANTISURFACE WARFARE IMPROVEMENT PROGRAM — The Antisurface Warfare Improvement Program (AIP) will provide an enhanced sensor and weapon capability. The program includes the incorporation of the Stand-off Land Attack and Maverick missiles, survivability enhancements, an advanced imaging radar, and electro-optic sensors. Other upgrades include improved C⁴I, and provisions for the near real-time connectivity of surveillance/reconnaissance data with battle group and national command decision makers.

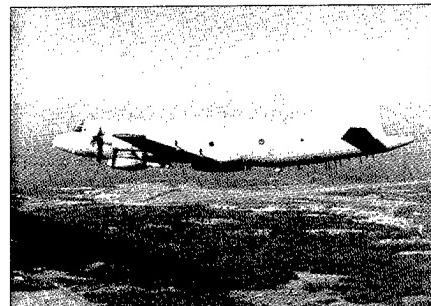
INVENTORY SUSTAINMENT — There are two funded service life-sustainment programs in place that will extend the P-3C's service life to 50 years. They are the Sustained Readiness Program (SRP) and the Service Life Extension Program (SLEP). SRP is a material condition upgrade which will redress corrosion areas and allow the P-3 to extend the current projected fatigue life of the airframe (20,000 hours). Long term, the SLEP will certify the airframe for an additional ten years of fatigue life. These service life extensions will delay the requirement for a follow-on aircraft — the notional Multimission Maritime Aircraft (MMA) — until approximately FY 2015.

P-3C Modernization Roadmap

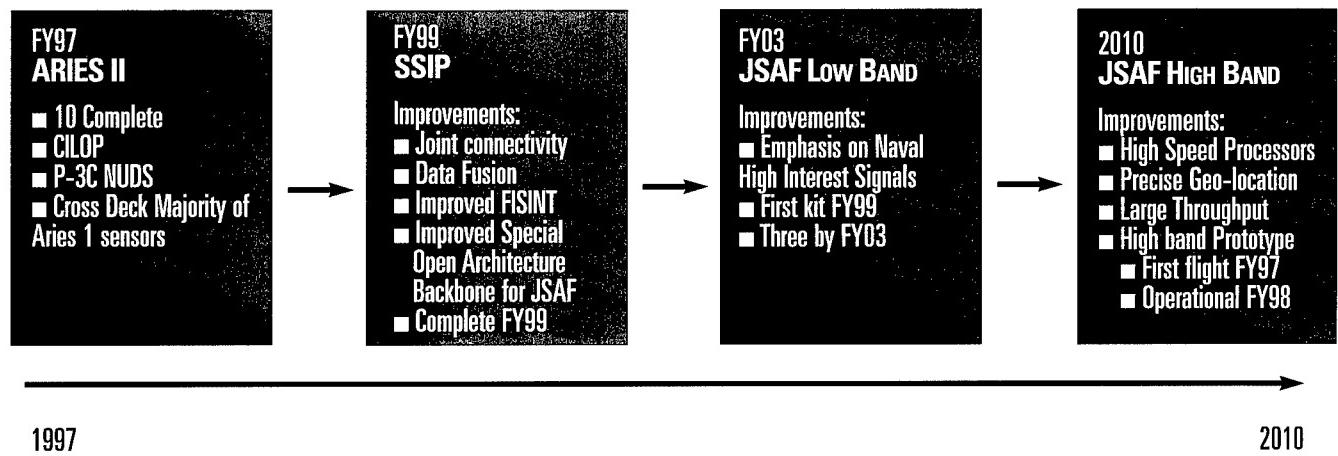


EP-3E ARIES II

The EP-3E is the Navy's land-based SIGINT reconnaissance aircraft based on the Orion airframe. The 12 aircraft in the Navy's inventory provide fleet and theater commanders worldwide with near real-time tactical SIGINT. With sensitive receivers and high-gain dish antennas, the EP-3E can exploit a wide range of electronic emissions from deep within enemy territory.



The Aries is currently undergoing a sensor system improvement program that will enhance its connectivity over a range of C⁴I links. In addition, mission software improvements will link offboard and onboard sensors, creating a fused tactical picture of the battlespace that can be used by the crew or sent in near real-time to other warfighters. The EP-3E will also act as a Department of Defense prototype for the high-band subsystem of the Joint SIGINT Avionics Family (JSAT). The JSAT program will provide the EP-3E with an open-architecture, state-of-the-art collection system capable of exploiting threat emissions through the year 2010.



E - 6 A / B MERCURY

The E-6A/B, derived from the Boeing 707, is a command, control, and communications (C^3) platform. The E-6A's Take Charge and Move Out (TACAMO) mission provides multiple C^3 links for Emergency Action Message (EAM) relay from the National Command Authority to strategic and non-strategic operating forces.

Designed to support a robust and flexible nuclear deterrence posture into the 21st century, the E-6B is currently incorporating Airborne National Command Post (ABNCP) equipment from retiring U.S. Air Force EC-135Cs. E-6As became fully operational in 1992, and E-6B initial operational capability will occur in 1998.

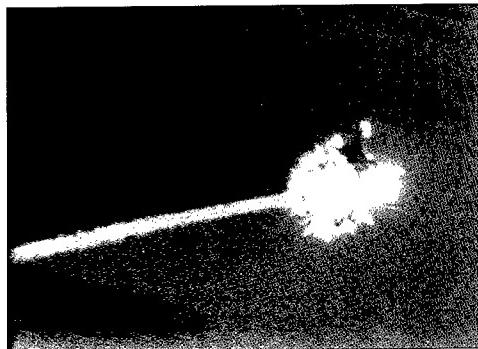
E-6As transmit and receive secure and non-secure voice and data at very low, low, and high frequencies, and also via UHF line-of-sight and satellite communications systems. The E-6A can deploy a 28,000-foot trailing-wire antenna and a 5,000-foot short trailing-wire antenna for Very Low Frequency (VLF) communications with submerged ballistic missile submarines. With in-flight refueling, the E-6B ABNCP is capable of providing up to 72 airborne hours of decision-level conferencing, force management, situation monitoring, and communications support.

The E-6B retains all E-6A capabilities and adds:

- Battle staff compartment for C^3 operations and an Airborne Launch Control Center for ICBM programming and launch
- Orbit Improvement System for increased VLF and low frequency (LF) transmit antenna efficiency
- GPS for improved navigation and timing signals
- UHF frequency division multiplexing for air/air and air/ground links; six STU-IIIR phones for secure voice and data transmissions; an LF transmit capability for increased frequency spectrum; and a Milstar EHF/UHF command post terminal for secure, survivable C^3 .

Follow-on improvement programs under consideration are a Multi-function Display System (MDS) for meeting Federal Aviation Administration and ICAO flight management and terminal requirements, and additional satellite C³ capabilities for improved Global Command and Control System interoperability supporting theater CINC missions.

AIR-TO-AIR MISSILES



U.S. Navy and Marine Corps F/A-18 strike-fighters armed with medium-range AMRAAM radar-guided missiles and short-range AIM-9X Sidewinder missiles with a Helmet-Mounted Cueing Sight (HMCS) will revolutionize air warfare in the next century. These weapons will change the manner in which we conduct air-to-air warfare. Our pilots will get the first look with aircraft radar or visually with an HMCS, fire the first shot with AMRAAM or a high off-boresight capable AIM-9X, and benefit from increased lethality and aircraft survivability.

AIM-120 AMRAAM

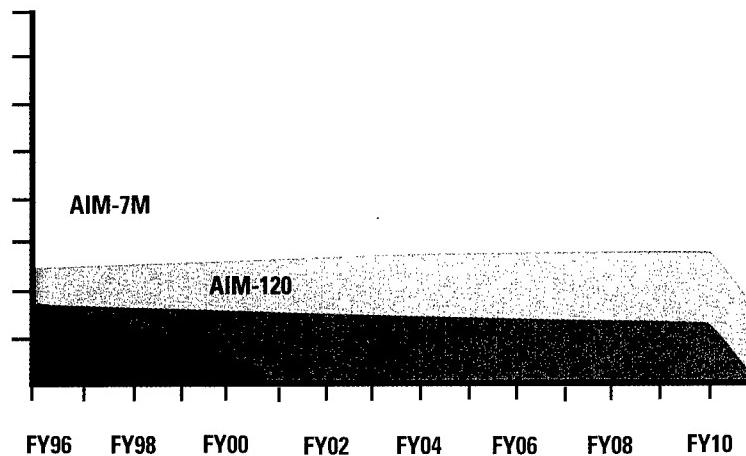
The AIM-120 AMRAAM missile is deployed on the F/A-18C/D, and will be deployed on F/A-18E/F and JSF aircraft. Joint U.S. Air Force and Navy procurement of AMRAAM continues, and deliveries of the reprogrammable AIM-120B have begun. The AIM-120C pre-planned product improvement program is a key factor in maintaining air superiority into the next century. This modernization plan includes clipped wings for internal F-22 carriage, a propulsion enhancement program, increased warhead lethality, and enhanced electronic counter-countermeasures (ECCM) capabilities through hardware and software upgrades.



Ultimately, AMRAAM will be the Department of the Navy's sole medium-range missile. As part of our neck-down strategy, the radar-guided AIM-54C Phoenix and AIM-7M Sparrow are out of production, and no further software or hardware improvements are planned.

Nevertheless, F-14 Tomcats armed with the AIM-54C and AIM-7M will remain effective air superiority fighters into the next century, and the AIM-54/AIM-7 inventory will support the Tomcat throughout its remaining service life.

Neckdown of Medium-Range Air-to-Air Missiles



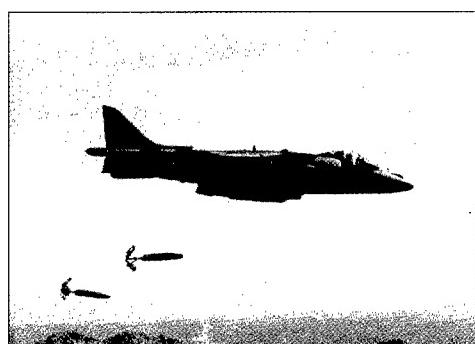
AIM-9 SIDEWINDER

The AIM-9M8/9 is the last of the planned upgrades to the existing, analog-based AIM-9M, and will incorporate enhanced infrared counter-countermeasure (IRCCM) features. The follow-on Sidewinder variant, AIM-9X, will include major digital modifications. AIM-9X will feature a high off-boresight, focal-plane array seeker mounted on a highly maneuverable airframe with reprogrammable IRCCM capabilities.



AIR - TO - GROUND WEAPONS

Naval Aviation possesses numerous types of air-to-ground weapons, all of which are designed for different targets, levels of accuracy, and lethality.



CLOSE-IN WEAPONS

Weapons such as the Mk-80 series General Purpose (GP) bomb family, Rockeye, Gator, and 2.75" and 5" rockets are close-in, direct-attack, unguided munitions. Close-in precision-guided munitions (PGMs), such as Laser-Guided Bombs (LGBs), AGM-65 Mavericks, and Hellfire II improve weapon lethality via increased accuracy.



Joint Direct Attack Munition

The Joint Direct Attack Munition (JDAM) currently under development is a multi-service effort to develop a strap-on, GPS-aided Inertial Navigation System (INS) guidance kit that will improve the accuracy of GP bombs in all weather conditions. JDAM also will allow a single aircraft to attack multiple targets from a single release point.

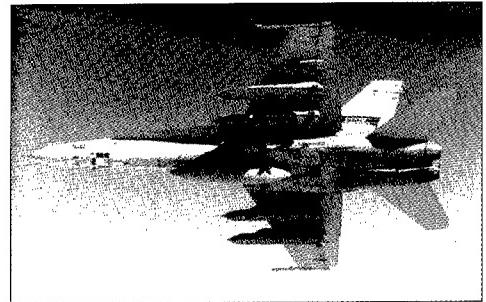
STAND-OFF WEAPONS

But Naval Aviation needs more than just close-in weapons. Point-defense surface-to-air missiles comprise approximately 85 percent of the weapons that make up enemy integrated air defense systems. Currently, Naval Aviation's capability to attack targets from beyond the range of these systems is limited to HARM, the Stand-off Land Attack Missile (SLAM), and the AGM-62 Walleye. These weapons acquire and home in on their targets using various techniques, including passive homing on radar and radio emitters (HARM) and electro-optics in the visible (Walleye) and infrared (SLAM) spectrums. However, they provide limited adverse weather capability and only carry a unitary warhead for attacks against point targets. HARM has shown great flexibility and continues to be upgraded; the Navy is currently developing Block V and VI modifications into the missile — giving it the capability to attack GPS jammers — and adding an INS/GPS suite. Walleye, developed in the 1960s, will be phased out of the inventory by 2005.

Joint Stand-off Weapon

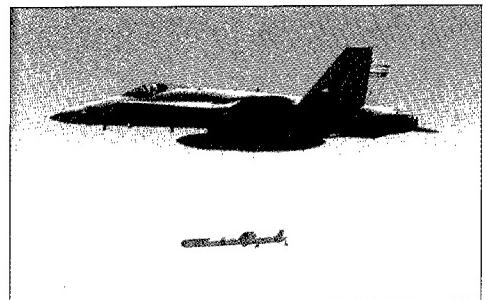
A new family of Stand-off Outside Point Defense weapons will be introduced to the fleet beginning in FY 1998-1999, beginning with the Joint Stand-Off Weapon (JSOW).

JSOW is another multi-service program that will replace five types of the older air-to-ground weapons currently in the naval inventory. It will provide a family of precision-guided weapons that will allow naval aircraft to attack area as well as point targets at increased stand-off distances, greatly increasing aircraft survivability. JSOW will be usable in adverse weather conditions, and like JDAM, will give aircrews the ability to attack multiple targets in a single sortie.



SLAM/SLAM-ER Expanded Response (ER)

SLAM-ER is Naval Aviation's follow on to the SLAM Stand-off Outside Area Defense weapon. It is a day/night, adverse-weather, precision-strike weapon with over-the-horizon range. SLAM is based on the highly successful and reliable Harpoon anti-ship missile, with a GPS-aided INS system for mid-course guidance, and a Maverick Imaging Infrared sensor and a Walleye data link for precise, "man-in-the-loop" terminal guidance.

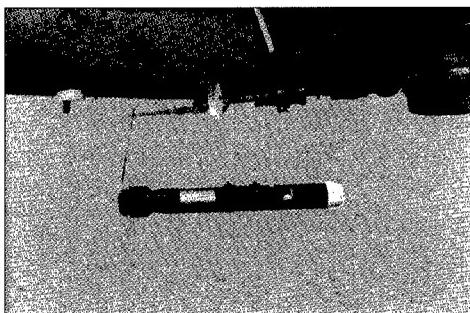


SLAM-ER is an evolutionary upgrade of SLAM, providing the Navy and Marine Corps with a major improvement in precision strike capability. A modified Tomahawk warhead improves lethality and penetration. New planar wings have been added, doubling the range and allowing terrain-following flight. Mission planning time has been reduced to 30 minutes, and targeting has been improved via a "freeze frame" command that also reduces pilot workload. SLAM-ER has been approved for production and will be fielded in 1999.

SLAM-ER+ will also incorporate Advanced Terminal Guidance (ATG), making it an autonomous weapon, and enhancing the missile's capability against small targets and targets in urban environments. ATG uses a matching algorithm to recognize both the target and the surrounding scene, eliminating the need for a data link. SLAM-ER weapons fitted with ATG will be fielded in the 1999-2000 timeframe.

AIR - TO - SUBSURFACE WEAPONS

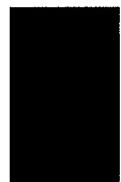
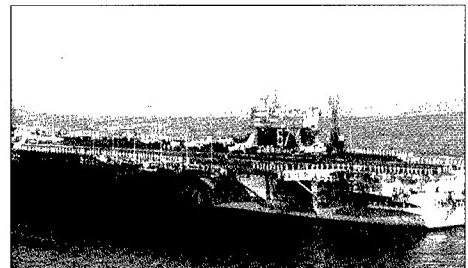
Fixed-wing aircraft and helicopters are ideal platforms to conduct both offensive and defensive undersea warfare. Having the advantages of quick reaction times, high search rates, and expeditious covert ingress and egress enables Naval Aviation to conduct both undersea warfare tasks, ASW, and mine warfare. The air-to-subsurface arsenal used to execute the USW mission includes torpedoes, mines, and depth bombs. Upgrades to existing munitions, coupled with improved sensors, delivery enhancements, and refined tactics, will keep pace with potential threat developments into the next century.



Undersea warfare weapons are being optimized for littoral operations. The Mk-50 and advanced lightweight hybrid torpedo (ALHT) have been designed to improve acquisition and lethality against shallow water targets. Additionally, a hydrostatic sensor is being developed to enable Mk-80 series general-purpose bombs to be utilized as a USW depth bomb against surfaced and near-surface, visually acquired targets. This range of weapons will help the Navy achieve undersea battlespace dominance from blue water to littoral waters.

NAVAL RESERVE AVIATION

The Reserve Aviation Force, consisting of both Navy and Marine Reserve units, is an integral part of Naval Aviation. Highly skilled and dedicated citizen-Sailors provide a full-time capability in most of the same mission areas as their active duty counterparts. Training in front-line equipment, Reserve aviation units provide an "up and ready" warfight-



ing capability — in whole or in part — from the first day of mobilization.

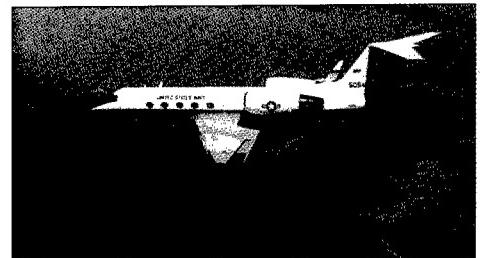


A Reserve Air Wing (CVWR), a Reserve Helicopter Wing, two Reserve Patrol Wings and a Reserve Marine Aircraft Wing (MAW) comprise the bulk of the reserve warfighting capability. One Fleet Logistics Support Wing rounds out the force structure and provides indigenous airlift support for the entire Navy.

The Marine Corps maintains one reserve air wing — the 4th MAW — whose primary mission is to augment and reinforce the active component. 4th MAW has 181 combat aircraft assigned to four Marine Aircraft Groups and six Operational Support Airlift aircraft assigned to two Air Support Detachments. Additionally, there is one Wing Support Group and one Marine Air Control Group that round out the Marine reserve aviation force structure. One of the Marine Reserve F/A-18A squadrons assigned to 4th MAW is a full participant in the Navy/Marine Corps tactical aviation integration program and is assigned to CVWR-20 when conducting joint training. Upon mobilization, that squadron would be assigned to CVWR-20 for combat duty in the Fleet.

LOGISTICS AIRLIFT

Logistical airlift support for Navy and Marine forces is provided by a variety of aircraft. While the C-2 Greyhound provides Carrier Onboard Delivery (COD) service between shore bases and carriers, Vertical Onboard Delivery (VOD) continues to be provided by the H-53, H-46 and H-3 helicopters. Intratheater transportation of passengers and cargo is provided by a fleet of C-130, C-9, C-20, and C-12 aircraft. These aircraft provide a responsive, efficient, and unique Fleet-essential airlift capability that supports Navy and Marine Corps global operations.



INTRATHEATER

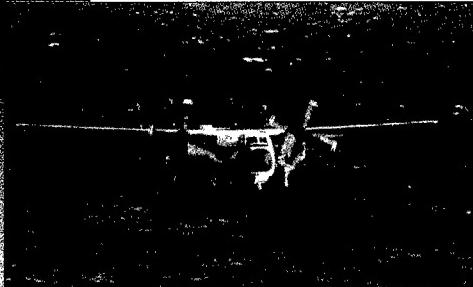
Naval Aviation recently completed the acquisition of 20 C-130T Hercules, and is in the process of procuring replacement aircraft for its current inventory of C-9 Skytrain platforms. These fixed-wing logistical airlift aircraft will receive safety-enhancing components, including GPS and the Flight Incident Recorder. Additionally, numerous modifications are being made to many of these platforms so they may continue providing valuable logistical airlift service to the Fleet.

CARRIER ONBOARD DELIVERY

With the ability to transport 10,000 pounds of cargo or 28 passengers from shore bases to the carrier at ranges in excess of 1,000 nautical miles, the C-2A Greyhound has been



the backbone of Carrier Onboard Delivery since its introduction in 1966. The Greyhound is the only fixed-wing, carrier-capable cargo aircraft in the world, and is the lifeblood of battle group operations. The C-2 provides an essential logistics link for high-priority cargo and parts, passenger transfer, and mail. From moving aircraft engines to medical evacuation to special-warfare SEAL team delivery, the Greyhound has demonstrated time and again its critical and unique role in Naval Aviation. The current C-2 fleet consists of reprocured aircraft delivered between 1985 and 1992. The Greyhound will embark on a SLEP at the turn of the century that will incorporate significant avionics upgrades, airframe enhancements, and safety improvements to carry the platform well into the next century.



TRAINING AIRCRAFT

PRIMARY FLIGHT TRAINING

The T-34 Mentor is the Navy and Marine Corps primary flight training aircraft. The current version, the T-34C, has been in service since 1978. This aircraft provides basic pilot and NFO training for the Navy, Marine Corps, Coast Guard and selected Air Force candidates. In 1994, joint primary flight training became a reality with the exchange of Air Force and Navy/Marine Corps instructors in two primary squadrons, VT-3 at Naval Air Station (NAS) Whiting Field, FL and the 35th Flight Training Squadron (FTS) at Reese Air Force Base in Lubbock, TX.

To further enhance multi-service flight training, Naval Aviation and the Air Force have jointly developed the next generation primary flight trainer — the T6A Texan II Joint

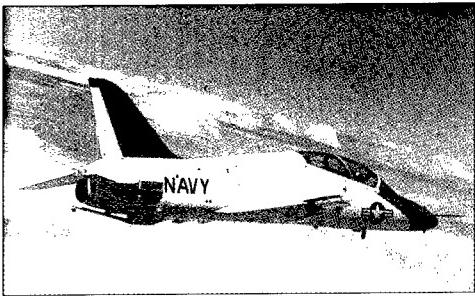
Primary Aircraft Training System (JPATS). JPATS includes state-of-the-art aircraft, full-motion simulators and computer-based systems training. The comprehensive syllabus has been designed to teach flight training basics to students from every service and will feed the pipelines to multi-engine, jet, and rotary-wing aircraft. The JPATS curriculum is scheduled to be introduced to



the Training Command in 2001 and will satisfy all primary flight training needs well into the 21st century.

INTERMEDIATE AND ADVANCED FLIGHT TRAINING

The T-2C Buckeye is the Navy's intermediate jet trainer used at NAS Meridian, MS, and is also used to train Naval Flight Officers at NAS Pensacola, FL. Advanced jet training is accomplished in the T/A-4J Skyhawk and the T-45A Goshawk. The TA-4J is in service at NAS Meridian, while T-45s fly from NAS Kingsville, TX. In 1998, the T-45 will replace the TA-4J at NAS Meridian as well, and will be used for all advanced jet



training. In 2003, the Goshawk will also replace the T-2C and will train all naval jet student pilots in a combined intermediate/advanced jet syllabus.

The Goshawk Training System combines academic, simulation, and flight phases into an integrated computer-based approach that greatly improves training efficiency and safety. The T-45A is an analog aircraft, while its follow-on Cockpit 21 is a digital aircraft that utilizes F/A-18-like HOTAS (Hands On Throttles And Stick) and Head-Up Display technology, including the military standard 1553 digital data bus.

Maritime intermediate/advanced propeller training is provided by the T-44A Pegasus aircraft at NAS Corpus Christi, TX and helicopter intermediate/advanced training is provided by the TH-57 Sea Ranger at NAS Whiting Field.

ADVERSARY AIRCRAFT

Naval Air Reserve and Marine adversary squadrons provide adversary training support to active duty squadrons. The Reserve squadrons dedicated to this mission employ the F-5E/F Tiger II and F/A-18A Hornets. Reserve F-14 and F/A-18 squadrons assigned to CVWR-20 play an adversary support role in addition to their regular mobilization training.

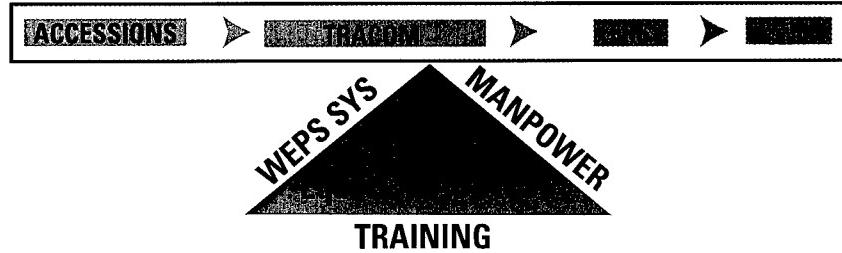
AIR CREW TRAINING

A well trained force is the major contributor to readiness. To sustain readiness today and in the future requires quality people, in sufficient numbers, with quality training. These elements, when combined with weapon systems and supported by sound operational doctrine equal operational dominance. Reduced to its basic form:

$$\begin{aligned} & (\text{Manpower} + \text{Weapon Systems} + \text{Doctrine}) \times \text{Training} = \\ & \quad \text{Operational Dominance} \end{aligned}$$

The major force multiplier in this overall equation is quality training. When viewed in relation to potential manpower challenges and reduced defense budgets, quality training remains the key element which must be sustained to maintain readiness.

Toward this goal, Naval Aviation has embarked on a training strategy which applies a systems view to address the three key elements of operational dominance. This strategy spans the full spectrum of the "Training Continuum" from aviation accessions through Fleet squadron training. This concept is captured in the accompanying figure.



To execute this strategy requires a balanced approach which includes: sufficient numbers of personnel accessed to meet Fleet requirements, quality training which spans undergraduate/graduate (Training Command through Fleet Replacement Squadron), and standardized Fleet squadron training. This strategy is being developed to ensure quality of training while realizing the impacts of constrained budgets today and in the future.

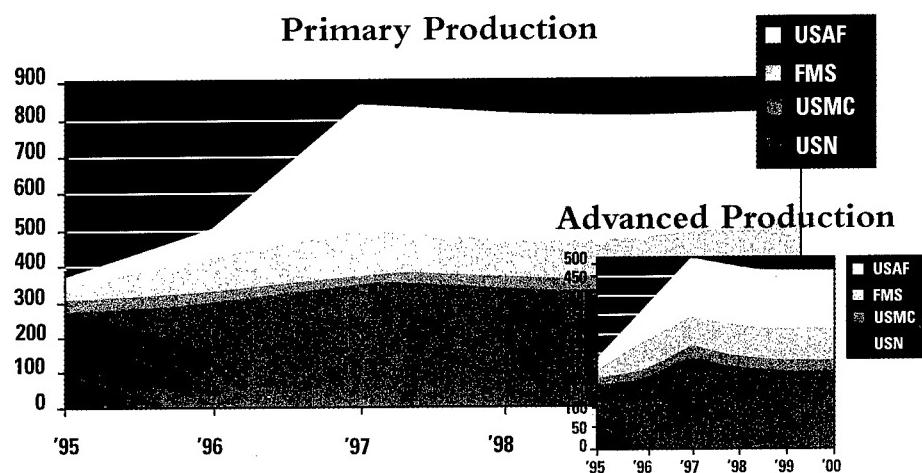
The major elements of this strategy include:

- Detailed, quantifiable manpower accession plans to support Fleet requirements.
- Development of a common Flight Simulator Strategy which provides a common architecture for new systems and defines a comprehensive plan to upgrade legacy systems. This plan will emphasize common databases and equipment where economically and operationally feasible.
- Application of advanced training system technology to include Computer-Based Training (CBT), Interactive Course Ware (ICW), and improved flight/tactics simulators.
- Integration of this technology into overall Ground-Based Training Systems (GBTS) such as the advanced undergraduate jet trainer T-45TS (Training System) and the Joint Primary Air Training System which will replace the T-34C primary training aircraft.
- Advancements in ground/sea-based training ranges such as the Joint Tactical Combat Training System (JTCTS).
- Full integration of Air Combat Training (ACT) and Operational Risk Management (ORM) into all phases of the training continuum. These efforts highlight the impact of safety as an integral part of training.
- Development of a standardized, aircraft-specific fleet squadron training program applying the concept of the Air Combat Training Continuum (ACTC).
- Integration of joint training where it makes sense. Towards this goal the Navy has taken the lead with the recent integration of all USAF Flight Officer and advanced turbo-prop pilot training into the Navy training system. The accompanying figures show the magnitude of this integration.

Naval Aviation has undertaken a proactive training strategy. This strategy has applied a balanced approach to training, incorporating the right technology to ensure quality of training while increasing potential efficiencies. The end goal remains a well-trained force, which ensures READINESS.

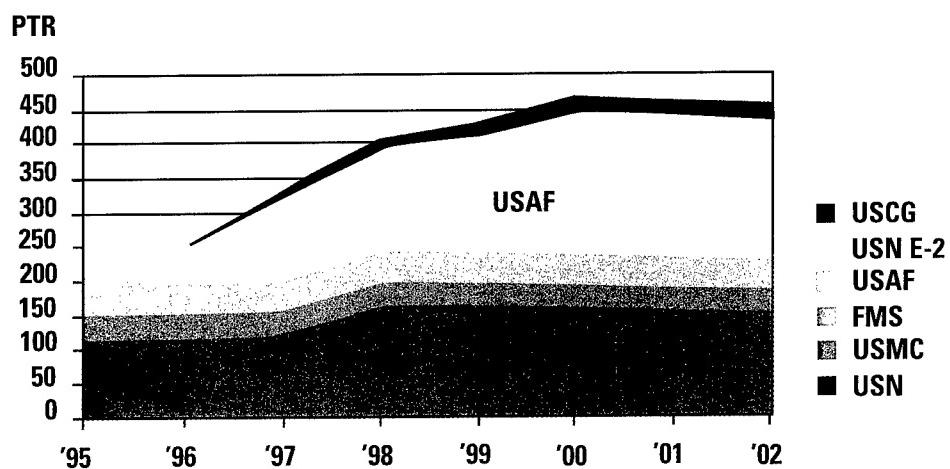
Naval/Joint Flight Officer Training

NAS Pensacola, FL



Naval/Joint Multi-Engine Pilot Training

NAS Corpus Christi, TX



AVIATION SPECIALIZED SKILLS TRAINING

Naval Aviation Technical Training is in a unique position today. Recent technological advances offer the training community an unprecedented opportunity to provide higher quality services to the Fleet and the schoolhouse. Today's technology can deliver training more effectively, faster, and at lower cost. Moreover, technology enhances the quality and accessibility of skills, knowledge, and information.

Naval Aviation Technical Training is governed through the Aviation Technical Training Executive Steering Committee (ESC) and its associated working groups. Recent ESC initiatives include:

- Implementation of "core and strand" concepts at "A" schools, and the realignment of the "C" schools
- Consolidation of the Fleet Readiness Aviation Maintenance Programs and Naval Aviation Maintenance Training Groups under the Chief of Naval Education and Training
- Reengineering the training "business process" culminating in the establishment of the Aviation Maintenance Training Continuum Systems (AMTCS).

The objectives of the AMTCS include providing a sequentially developed training curriculum based on "job task analysis" — facilitating training, eliminating redundancy, implementing common metrics, providing training feedback mechanisms, and establishing a repository for maintaining and tracking individual training records across the continuum. For the Aviation Maintenance In-Service Training (AMIST) phase, the goal is not only to sustain but also to increase the skill level of the technician in the Fleet. The critical theme behind this system is that the same technology (with minor variations) will satisfy both Fleet and school training requirements.

The synergistic effect of the technologies under development (such as Computer-Based Training and Automated Management Systems) allows the Navy to develop 21st century training concepts. Timely training for Sailors and Marines at shore locations, pier-side, and at sea will be readily available. Even as we reduce aviation manpower, our training programs will ensure that the quality of the force remains as high as ever.

LOGISTICS

Naval Aviation continues to provide our nation's leaders with a flexible, forward-deployed global military presence. Navy and Marine Corps aircraft routinely conduct missions in every corner of the world, unencumbered by the need for host nation support. This extraordinary operational capability is enabled and sustained by a largely self-sufficient, integrated logistics support system that is easily adapted to meet changing demands. This system is dedicated to uncompromised force sustainment; it embodies both cutting edge technology and highly disciplined processes that allow complex aerospace weapons to be maintained in the demanding maritime environment at the highest levels of safety and effectiveness.

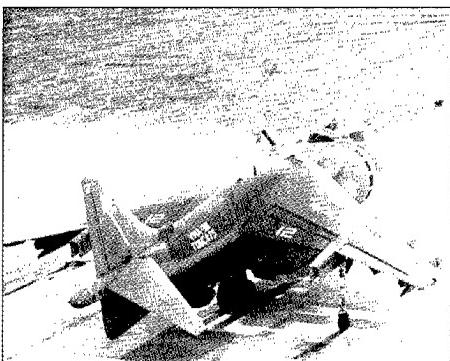


With a "cradle-to-grave" platform focus, forward-looking logistics managers establish clear support objectives and use integrated program teams to guarantee their responsiveness. Dedicated in-service engineers target the reliability and maintainability of weapon system components, adjusting support plans as necessary. Supply support experts compute the aviation spares required to maximize readiness while keeping costs stabilized for the entire system.

Total cost visibility is an integral part of support system planning and execution. Identifying and tracking operating and support cost drivers through the life of the weapon system allows logistics managers to make informed trade-off decisions between support resources and mission requirements. The Navy's aviation industrial policy has produced dramatic reductions in excess infrastructure and associated costs. The three Naval Aviation depots at North Island, California; Jacksonville, Florida; and Cherry Point, North Carolina are now providing the support previously distributed among six. The Navy's total aviation industrial strategy includes teaming with inter-service activities, such as Corpus Christi Army Depot in Texas and Oklahoma City Air Logistics Center, as well as commercial activities throughout the nation.

To reduce out-of-service time and total costs in material and manpower, we are changing the process for some aircraft from their original standard depot level maintenance (SDLM) to a reliability centered maintenance (RCM)-based phased depot maintenance (PDM) program which will inspect and preserve the aircraft before damage occurs. Looking to the future, our vision is one of increasingly affordable readiness. We will cut costs by driving reliability up and by fully exploiting the support commonalities that exist between the Navy's aviation, surface and subsurface communities, enhancing our ability to operate as one Navy-Marine Corps fighting team that will fully support our mission requirements well into the 21st century.

EXPEDITIONARY AIRFIELDS



With the reduction of overseas foreign bases in recent years, retaining our capacity to construct and operate Expeditionary Airfields (EAF) has become increasingly more important. The EAF supports a continuum of air base operations, ranging from small, dispersed Forward Arming and Refueling Points to the establishment of large main bases. The EAF system is unique and flexible, permitting Naval Aviation to operate from captured or damaged runways, parking lots, or roads, or to

establish bases where none previously existed. A complete EAF will be part of each Enhanced MPF squadron.

Consequently, the Marine Corps is heavily investing in the modernization of its EAF capability, especially to replace obsolescent components and systems fielded in the late 1950s and early to mid-1960s. The Marine Corps will be acquiring newer, more mobile, and more capable visual landing aids, arresting gear, and lightweight runway matting. These efforts will enhance the EAF's capability to function in many different environments, respond to dynamic operational requirements, and support diverse aviation platforms, from the STOVL Joint Strike Fighter to the V-22 Osprey.

AIR TRAFFIC CONTROL

Naval Aviation requires adequate airspace and ranges to practice tactics, perform research and development, to train realistically (i.e., to train as we will fight), and to transit aircraft from airfields to ranges. The Federal Aviation Administration (FAA) recently introduced the concept of Free Flight, which empowers the pilot to choose where the aircraft will fly based on the most economic route. Because of the Free Flight concept, we will be under increased pressure to allow civilian access to military special-use airspace.

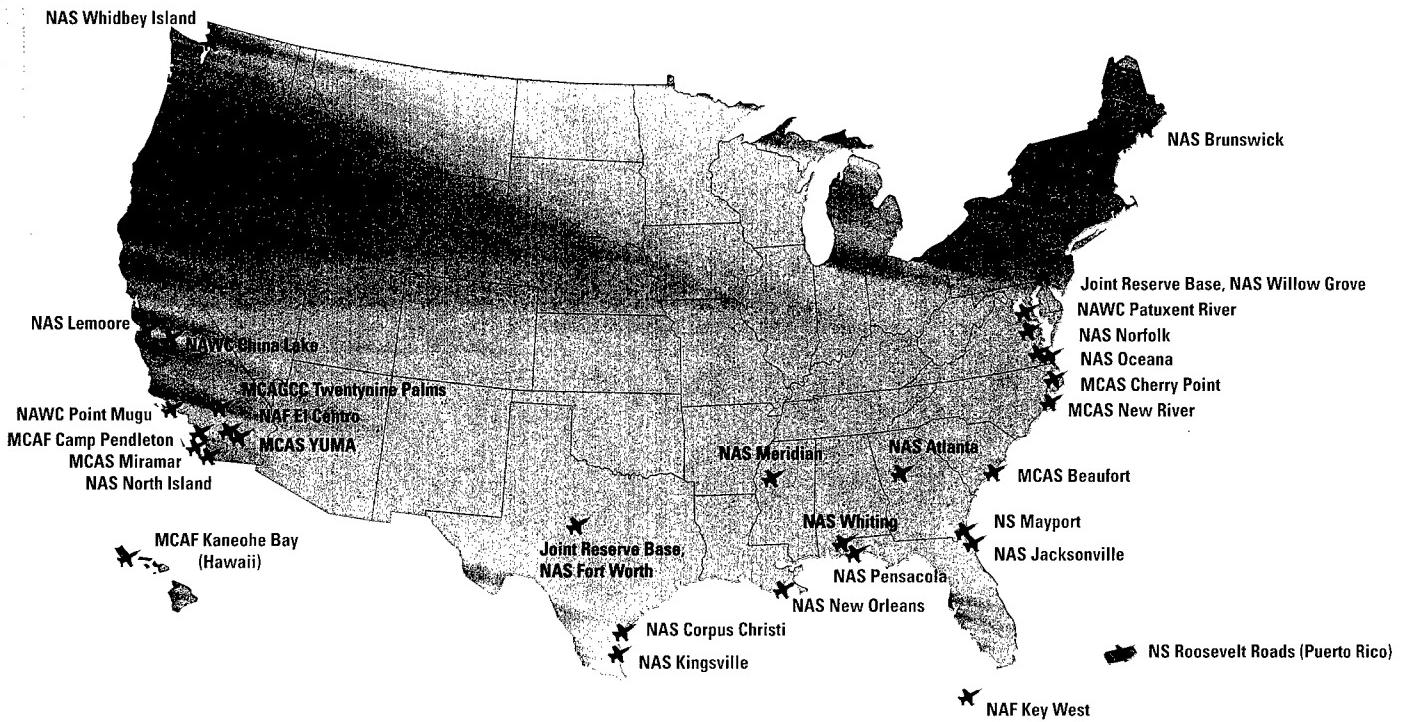
To ensure we retain the special use airspace we need, the Department of the Navy and the Department of Defense are investing in a Military Airspace Management System that will closely track the utilization of special use-airspace, documenting who uses it, and why. Additionally, air traffic control (ATC) equipment located at NAS and Marine Corps Air Station (MCAS) approach controls is being upgraded in coordination with the FAA to ensure that naval aircraft are handled as efficiently and expeditiously as civilian aircraft. Naval Aviation is involved with the other services to define the next generation Joint Precision approach capability and to determine the timing of upgrades to aircraft avionics which will ensure our continued access to airspace worldwide.



RANGES AND AIRFIELDS

Supporting elements which are essential to Naval Aviation's mission include the ranges in which aircraft fly and the air stations and airfields at which they are based. The drawdown, with its associated base closure and realignment, has streamlined Naval Aviation's overall infrastructure, thereby allowing scarce resources to be utilized for training and readiness. The accompanying map illustrates the facilities.

NAVY AND MARINE CORPS AIR INSTALLATIONS



WEST

- MCAF Kaneohe Bay, Hawaii
- NAF Atsugi, Japan
- NAF Misawa, Japan
- MCAS Iwakuni, Japan
- MCAS Futenma, Okinawa
- NAS Barbers Point, Hawaii
- NAVSUPFAC Diego Garcia

MAJOR OVERSEAS NAVAL AIR INSTALLATIONS

WEST

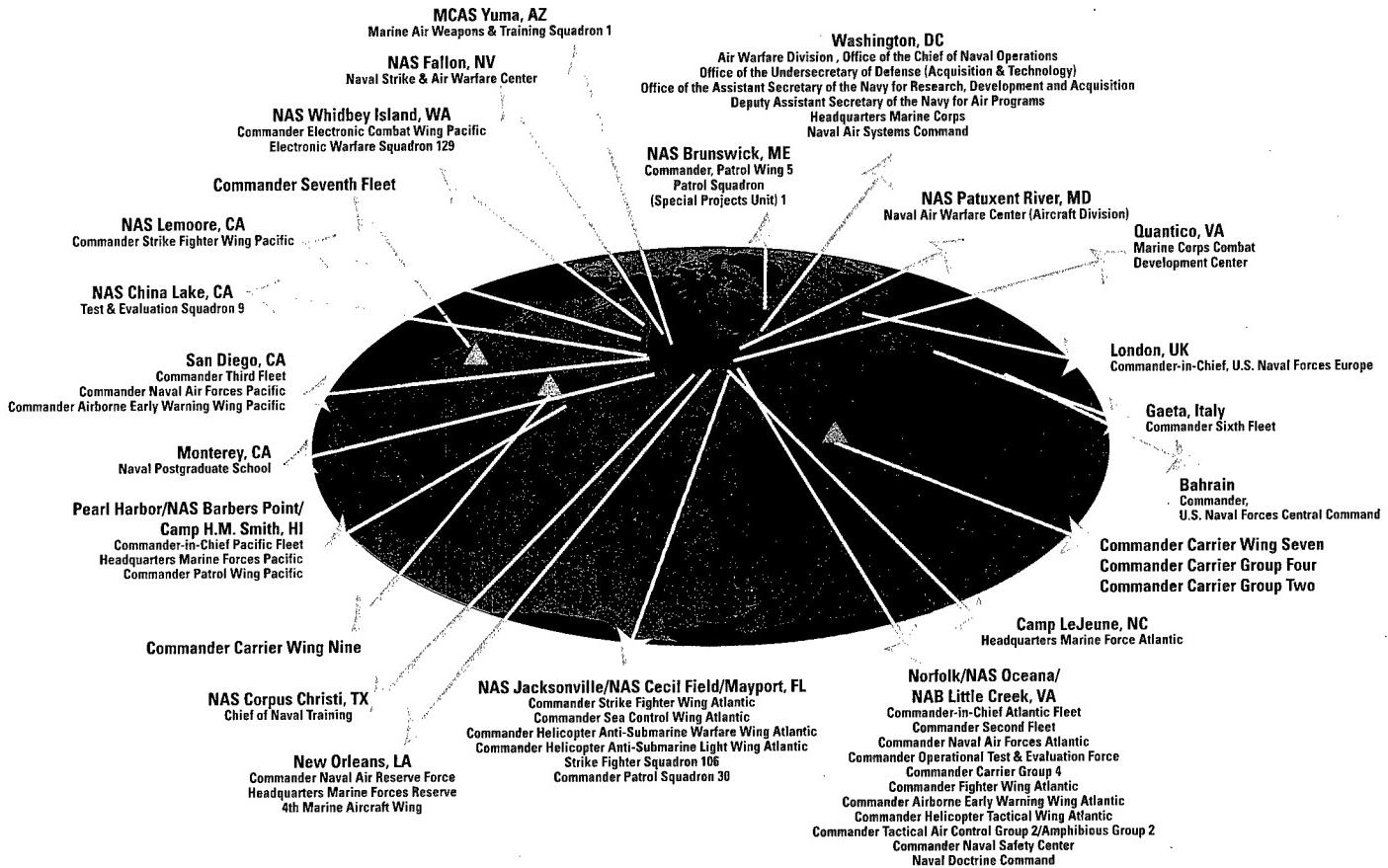
- NAVSTA Guantanamo Bay, Cuba
- NAVSTA Roosevelt Roads, Puerto Rico
- NAVSTA Rota, Spain
- NAS Sigonella, Sicily
- NAS Keflavik, Iceland
- NAVSUPPAC Souda Bay, Greece
- NAF Naples, Italy
- NAF Mildenhall, England

ACRONYMS

ABNCP	Airborne National Command Post
ACDS.....	Advanced Combat Direction System
ACTD	Advanced Concept Technology Demonstration
ADAR	Air-Deployable Active Receiver
AIP	Anti-surface warfare Improvement Program
ALFS	Airborne Low Frequency Sonar
ALHT	Advanced Lightweight Hybrid Torpedo
AMRAAM	Advanced Medium-Range Air-to-Air Missile
ASN	Assistant Secretary of the Navy
ASUW	Anti-Surface Warfare
ASW	Anti-Submarine Warfare
ATARS	Advanced Tactical Air Reconnaissance System
ATC.....	Air Traffic Control
ATD	Advanced Technology Demonstration
ATG	Advanced Terminal Guidance
BGPHES	Battle Group Passive Horizon Extension System
C ⁴ ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CEC	Cooperative Engagement Capability
CNET.....	Chief of Naval Education and Training
COD	Carrier Onboard Delivery
COTS	Commercial Off-The-Shelf
CSA	Common Support Aircraft
CSAR	Combat Search and Rescue
CVW	Carrier Air Wing
CVWR	Reserve Air Wing
CVX	Next-generation aircraft carrier
DCS.....	Digital Communication System
DCS (AIR)	Deputy Chief of Staff for Aviation (USMC)
DFCS	Digital Flight Control System
DPIA	Docking Planned Incremental Availabilities
EAF	Expeditionary Airfield
EAM	Emergency Action Message
EHF	Extremely High Frequency
E&MD	Engineering and Manufacturing Development
ESSM	Evolved Sea Sparrow Missile
FAA	Federal Aviation Administration
FAC	Forward Air Controller
FIR	Flight Incident Recorder
FLIR	Forward-Looking Infrared
FTS	Flight Training Squadron
GCCS	Global Command and Control System
GPS	Global Positioning System
HAE	High-Altitude Endurance
HARM	High-speed Anti-Radiation Missile
HMCS	Helmet-Mounted Cueing System
HUD.....	Head-Up Display
IADS	Integrated Air Defense System
ICAP.....	Improved Capabilities
ICOLS.....	Improved Carrier Optical Landing System
IEER	Improved Extended Echo Ranging
IFLOLS	Improved Fresnel Lens Optical Landing System
IMP	Incremental Maintenance Plan
IOC.....	Initial Operational Capability
ISAR.....	Inverse Synthetic Aperture Radar
JDAM	Joint Direct Attack Munition
JMCIS	Joint Maritime Command Information System
JPATS.....	Joint Primary Aircraft Training System

JSAF	Joint SIGINT Avionics Family
JSF	Joint Strike Fighter
JSOW	Joint Stand-Off Weapon
JTIDS	Joint Tactical Information Distribution System
LANTIRN	Low-Altitude Navigation and Targeting Infrared for Night
LGB	Laser-Guided Bomb
LLL	Low-Level Light
LOE	Level of Effort
LRD	Laser Ranger Designator
LRLS	Long-Range Line-up System
MAE	Medium-Altitude Endurance
MAW	Marine Corps Aircraft Wing
MCAS	Marine Corps Air Station
MCU	Mission Computer Upgrade
MDS	Multi-function Display System
MEU(SOC)	Marine Expeditionary Unit, Special Operations Capable
MMA	Multi-Mission Maritime Aircraft
NALG	Naval Aviation Liaison Group
NDI	Non-Developmental Item
NVG	Night Vision Goggle
ONR	Office of Naval Research
OTCIXS	Officer in Tactical Command Information Exchange System
PERSTEMPO	Personnel Tempo
PIA	Planned Incremental Availabilities
PMA	Program Manager, Aviation
R&D	Research and Development
RCOH	Refueling Complex Overhaul
RMP	Radar Modernization Program
S&T	Science and Technology
SAR	Synthetic Aperture Radar
SATCOM	Satellite Communications
SBIR	Small Business Innovation Research
SHF	Super High Frequency
SIGINT	Signals Intelligence
SLAM	Stand-off Land Attack Missile
SLEP	Service Life Extension Program
SOAD	Stand-off Outside Area Defense
SOPD	Stand-off Outside Point Defense
SRP	Sustained Readiness Program
SSIP	Sensor System Improvement Program
STOVL	Short Take-Off/Vertical Landing
TAC	Tactical Air Controller
TACAMO	Take Charge And Move Out
TAMPS	Tactical Automated Mission Planning System
TARPS	Tactical Airborne Reconnaissance Pod System
TCS	Tactical Control Station
TERPES	Tactical Electronic Processing and Evaluation System
TIBS/IBS	Tactical Information Broadcast System/Information Broadcast System
TSC	Tactical Support Center
TUAV	Tactical Unmanned Aerial Vehicle
UAV	Unmanned Aerial Vehicle
V/STOL	Vertical/Short Takeoff and Landing
VHF	Very High Frequency
VOD	Vertical Onboard Delivery

LOCATIONS OF COMMANDS PARTICIPATING IN THE NAVAL AVIATION VISION DEVELOPMENT PROCESS



Thanks to the professionals who contributed expertise and many hours to make this Strategic Vision and plan possible:

Mr. Stephen J. Kapurch, technical advisor and editor
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 Mr. Bill McGovern, strategic planning advisor
 LtCol Steve York, USMC policy and strategic planning advisor
 Mr. Rod Rodman, mission analysis

The Director, Naval Air Warfare wishes to express appreciation to all of the Fleet representatives who were the key contributors to this effort. If it was not for their dedication and support this effort would not have been possible.

DIRECTOR AIR WARFARE CLOSING REMARKS

Lieutenant T.G. "Spuds" Ellyson qualified in the Navy's first aircraft in 1911, giving birth to Naval Aviation. Since then, an enduring reality has been Naval Aviation's constant adaptation to our changing world. Naval Aviation has always embraced change, and change has served us well. As the world situation changed or technology advanced, Naval Aviation was able to adapt and improve. This adaptability and flexibility have allowed us to remain the force of choice — ready to go in harm's way when the President asks, "Where is the closest carrier?" This publication is the result of many thoughtful discussions and a lot of hard work by our Strategic Long-Range Vision team. The team was composed of Fleet aviators from all communities in Navy and Marine Corps Aviation with a strong representation from the junior officer corps. Working diligently over a nine month period, the team conducted a thorough review of what Naval Aviation will be required to do in the context of future geopolitical strategic environments. The team's objective was to take an intensive look at the way we do business and how we can improve Naval Aviation to keep us vital and relevant to our nation's security needs. The team's review was wide ranging — from how we are organized to future budgets to technology trends — including everything from how we recruit and train people to how we supply and sustain. Our goal was to produce a document that would take a balanced and all-inclusive approach to Naval Aviation — one which we can all truly claim ownership. I thank the entire team for their work in producing this document and for their continuing refinement of Naval Aviation's course to the future.

The dramatic changes of the last several years and the subsequent reorientation of our naval strategy, as articulated in *Forward...From the Sea* and ...*From the Sea*, toward an expeditionary force are serving the nation well. One of our major conclusions is that this strategy remains relevant. There is no need for a major reinvention of Naval Aviation. We must, however, leverage technology and innovation to exploit capabilities in information warfare, precision strike and operational maneuver. In this era of information technology and open global markets, a potential adversary has the ability to easily obtain sophisticated weapon systems. Our challenge is to remain two steps ahead of him. This dangerous and unpredictable world will mean that our unique, unencumbered forward presence will be even more critical in the 21st century. Because of our expeditionary nature and flexible air power, forward from the sea, Navy and Marine Corps Aviation is — and will remain — the force of choice.



Dennis V. McGinn
Rear Admiral, U.S. Navy
Director, Air Warfare Division (N88)



Office of Naval Operations
Director, Air Warfare
Pentagon, Washington, D.C.
20350-2000
703-693-2625
DSN 223-2625

